ENGINEERING and MINING JOURNAL.

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TABLE FOR THE CONVERSION OF ENGLISH AND METRIC UNITS.

This table is based on the authority of RANKINE, and is correct to the fourth decimal place.

1 Meter = 3·2808 feet.
1 Foot = 0·3047 m.
1 Liter (vol. of 1 kilog. water) = 0·2202 gal.
1 Gallon (vol. of 10 lbs. water) = 4·541 liters.
1 Kilog. per sq. meter = 0·2048 lbs. per sq. ft.
1 Kilog. per sq. m.m. = 1422·23 lbs. per sq. in.
1 Lb. per sq. in. = 703·0358 kilogs. per sq. m.
1 Gram = 15·4323 grs.
1 Grain = 0·0348 gram.
1 Kilogrameter = 7·2331 ft.-lbs.
1 Foot-pound = 0·1383 kgm.
1 Atmosphere = 14·7 lbs. per sq. in. = 10333 kilogs. per sq. meter = 29·922 in. or 760 mm. of mercury = 33·9 ft. or 10⅓ meters water.
1 Kilogram = 2·2046 lbs. av.
1 Pound av. = 0·4536 kilog.
1 Deg. Centigrade = 5-9 deg. F.−32°.
1 Deg. Fahrenheit = 9-5 deg. C. + 32°.
1 Calorie (kilog. water raised 1° C.) = 424 kilorgrameters = 3·9683 heat-units.
1 Heat-unit (lb. water raised 1° F.) = 772 ft.-lbs = 0·252 cal.

AMERICAN INSTITUTE OF MINING ENGINEERS—ANNUAL MEETING.

The annual meeting of the Institute will be held in Baltimore, beginning Tuesday evening, February 18th, at eight o'clock. The sessions will be held in the small lecture-room (ground floor) of the Academy of Music.

The head-quarters for members will be the Carrollton Hotel, Light and German streets, and the following special rates of board are offered to members: Three dollars per day for rooms on first and second floors, two dollars per day for third and fourth floors.

Before any arrangement can be made for special rates by railroad, it is necessary to know, approximately, the number who expect to attend the meeting. Members must, therefore, notify the Secretary promptly of their intention to go to the meeting, and, if reduced rates can be obtained, they will be notified personally of the arrangement.

Blank proposals of membership accompany this notice for the convenience of those who desire to propose members or associates to be elected at the meeting.

The following papers have already (January 24th) been announced:

J. H. HARDEN, Philadelphia—"Imperfections in Surveying Instruments."
ELLIS CLARK, JR., Easton, Pa.—"The Great Blast at the Limestone Quarry, Glendon."
ELLSWORTH DAGGETT, Salt Lake City, Utah—"An Improved System of Cornish Pit Work."
A. L. HOLLEY, New York—"The Pernot Furnace."
W. P. BLAKE, New Haven, Conn.—Ice Mining and Storing."
J. A. HERRICK, Nashua, N. H.—"An Improved Universal Suspended Hydraulic Lift."
CHARLES A. ASHBURNER, Philadelphia—"The Bradford Oil District, McKean County, Pa."
T. STERRY HUNT, Montreal—"Hocking Valley (Ohio) Coal and Iron Region."
F. FIRMSTONE, Easton, Pa.—"Indicator Cards from a Water-Pressure Blowing-Engine."
T. M. DROWN, Easton, Pa.—"Determination of Silicon in Pig-Iron."

The discussion of Dr. C. B. Dudley's paper, read at the Lake George Meeting, on the "Chemical Composition and Physical Properties of Steel Rails," will also come up at this meeting.

Yours, respectfully, THOMAS M. DROWN, Secretary.

THE CONFLICTING LEADVILLE (COLO.) MINING DECISIONS.

Two very important and, as we are informed, directly conflicting decisions have been made by the Colorado courts on the Leadville mining title cases. We publish in another column a summary of the decision in the Stevens & Leiter *vs.* Williams case, where it was decided that these contact deposits of Leadville come under the same law as fissure veins or lodes, and the oldest claim holds the bed through all its dips and spurs and angles wherever it goes, so long as it does not go beyond the limits of the produced end lines of the claim.

The telegraph has just brought us word that in the case of the New Discovery Lode *vs.* the Little Chief, the courts have taken an exactly opposite view, and, for reasons not yet learned, but which we will give in our next issue, have decided that the Leadville deposits are not "veins or lodes," in the legal sense, and that claims on them are limited by vertical planes through their side and end boundary lines. In other words, that a miner can not follow the ore beyond the limits of his surface location.

This decision is apparently in direct conflict with that of Stevens & Leiter *vs.* Williams; but till we have received fuller information of the grounds upon which it was rendered, we forbear discussing it. We are informed that it has created the utmost enthusiasm in Leadville, which we can well imagine; for the effect of the other decision referred to would be to reduce the owners of Leadville mines to a very small number. A year ago, we urged in these columns the adoption of the vertical plane boundaries for those deposits, and had our advice been then acted on, it would have greatly reduced the uncertainty now existing concerning the value of Leadville titles.

The decision has other and exceedingly important bearings, which we shall discuss in our next.

THE ISABELLA MILL AND MINING COMPANY.

We have received from an "old correspondent," at Globe, Arizona, a very severe letter concerning the Isabella Mill and Mining Co. of that place, a concern which has already been noticed in these pages, on account of the fact that its stock was being disposed of through the influence of the Church. Our correspondent makes several statements which are emphatically contradicted by Mr. S. G. Holbrook, Vice-President of the Company. We therefore, for the present, withhold our correspondent's letter till we get further light. At the same time we may state some of the points *pro* and *con*. Our correspondent says:

1. That the Isabella enterprise is a complete failure.

2. That the five-stamp mill was purchased from another company, and was to be paid for out of the bullion product, and does not belong to the Isabella Mill and Mining Company.

3. That "out of the 600 tons of magnificent ore that were supposed to be in the doctored dumps at the mines, 35 tons were all that were worth hauling to the mill, and when that quantity was assorted down to a paying grade, it came to only 18 tons. The yield in silver bullion was 923 ounces, 950 fine; and when the modest bar had been brought forth after a terrific time of 'labor,' the mill, as if exhausted, was 'shut down,' and to-day it stands silent and dead, a memento of sharp operating as well as of blasted hopes."

4. That several of the company's claims promise well, but they are as yet wholly undeveloped, and will take from five to ten thousand dollars to tell what they are.

In answer, Vice-President S. G. HOLBROOK says:

1. Work is now and has been steadily going forward on the mine.

2. That the mill belongs to the Isabella Company, and was paid for in stock.

"3. That he does not know how much ore has been crushed, nor how much bullion has been produced; but he does, of his own knowledge, know that it has produced more than 923 ounces of silver, and that the stoppage of the mill was for want of water, the well not being deep enough; that the ore treated was not the best ore; and that "the yield was equal to their expectations."

It will be recollected the official statements were, that the ore averaged some $400 to $500 to the ton. The Vice-President of the Company thinks the Isabella enterprise will yet come out all right; but there is a noticeable diminution of enthusiasm and confidence with regard to the large dividends promised. We are also informed by Mr. Holbrook that he thinks the amount of Isabella stock sold in this market was less than 10,000 shares, and that it brought not more than $40,000. As some of it was sold at $10 a share, there must have been pretty heavy "shading" for stock stated in the *Christian Advocate* to be worth "more than double" $10 a share.

Perhaps the most noticeable feature in the management of this enterprise is the deplorable degree of ignorance concerning the amount of work done at the mine and mill, the yield of the ore, the cost of mining or milling, and in fact the total absence of any specific knowledge of the company's business by its representative in this city.

We see as yet no reason to change our opinion that "this is an excellent concern to let alone." There is, however, one hopeful feature to

record. We are told that Mr. SPENCE, the President of the East Tennessee Wesleyan University, is going out to examine the property, and has decided to follow the advice given him in these pages in October last, by securing the services of Mr. KEYES, or JANIN, or ASHBURNER, of San Francisco, to examine and report on the property. Though this course should have been taken months ago, it is better late than never, and we shall gladly put on record as an opinion worthy of full confidence the report of either of these gentlemen.

THE NATIONAL SURVEYS.—II.

Although at the present writing the fate, in the House of Representatives, of the measure reorganizing the National Surveys is yet undecided, it is possible that before this article reaches our readers the subject may have been passed upon by that body, and sent to the Senate. The methods of transacting public business in Congress are (as Mr. HOAR has pointed out in the February *North American Review*) so affected by existing rules, and by the large number of representatives and of committees, that it is almost impossible to get a bill wisely modified by the deliberations of the House; and when a plan like the one to which we now refer has once been matured in committee, it is likely either to succeed or fail as a whole. If these are indeed the alternatives between which we have to choose, we should, as we have already said, prefer to see the bill pass. But we are not equally in favor of all its provisions. The unification of the geological surveys by the creation of a special Bureau to organize and systematize this great national work has our hearty approval. Such a Bureau ought to become for the United States what the *Geologische Reichsanstalt* is to the Austro-Hungarian empire; and under a competent director, this high expectation might be realized.

The geodetic surveys of precision also might with advantage be placed under a single administrative head. But it is not by any means clear to us that the radical change of organization proposed by the Academy, by which the land-parceling surveys are to be joined with the geodetic surveys, and the Coast Survey practically put in charge of both, under the Department of the Interior, is a wise arrangement. We have given full force in former articles to the fact that the Academy recommends the appointment of a special commission to devise a plan for the land-surveys; but the criticism remains without satisfactory answer that the Academy has to some extent tied the hands of this commission in advance.

The larger part of our interior geodetic work has been done under the War Department. A very large part will, according to the Academy's plan, still be done under that department—namely, the completion of the Lake Survey, the Survey of the Mississippi, and all future surveys connected with public works, fortifications, or military matters. It is quite possible, then, that an expert commission, considering the question of "unifying" the exact geodetic work of the country, might deem it wiser to put it all under that department, which has done and will do so much of it, and to leave the land-parceling to be performed for the Land Office under the Interior Department. Or, such a commission might decide that the Coast Survey, like the Lake Survey, should cease when the work for which it was created had been finished. But both of these conclusions are now forbidden in advance.

Meanwhile, a controversy has arisen which threatens to involve the failure of the whole measure, though it affects only the features to which we have just alluded. The Engineers and the Coast Survey are in conflict. Gen. COMSTOCK, having published certain estimates of the cost of the Coast Survey maps, is contradicted by Superintendent PATTERSON, who claims that many items of expense have been unfairly included. Gen. COMSTOCK rejoins, and we may expect to hear again from Mr. PATTERSON. We do not take up the details of this controversy, because we care nothing for it as a question of details. No reasonable man doubts that the actual expense of doing a particular kind of work will not widely vary with the department under which it is done. But the heavy expenditures of the Coast Survey are partly due to the fact that it has done a great deal for science, which it was not specifically directed to do by law. How far a governmental agency can properly go in this direction is a delicate question. We should think that a recent very valuable essay on "The Logic of Relations," issued by the Coast Survey, was an extreme instance of discretionary expenditure. Much of the magnetic work of that Survey, the whole of its interior geodetic work, and the extension of its labors far above tide-water on the Mississippi (duplicating the operations which the Engineers have been directed by law to execute, and are now executing), belong in the category of zealous undertakings for the benefit of science and the credit of a brilliant scientific organization; but they can not be shown, even by "the logic of relations," to be really related to the interests of ocean-navigation, for which the Coast Survey was created. The notion that a transcontinental triangulation, for instance, was required to connect the surveys of the two coasts, in the interest of navigation, is scarcely reasonable. It is easy to see how it has come to pass that the expenditures of this Bureau have been so large in proportion to the results, as measured in area of maps. It has been constantly doing more than it was ordered to do.

This overflow of activity has not been possible under the stricter regulations and supervision of the War Department. The army engineers and their civilian employés can do nothing that they are not definitely authorized to do. No matter how eminent in science one of them may be, or how much he would like to investigate and experiment, he must have the permission, or he can not incur the expense. This is one of the grounds on which we would prefer to see the geodetic surveys put under the War Department; but we shall be content if a similar system can be enforced elsewhere. The reason that civilian scientists sometimes object to serve under the War Department is a reason for overruling their objections. They do not wish to be under supervision; but they ought to be. They do not like red tape; but red tape is necessary. And we hope that whatever department has charge of the various branches of public service now under consideration, its subordinates and employés will be as strictly held to accountability, and appointed, promoted, and removed on grounds as far removed from politics, as are the officers of the army.

With one further suggestion, we leave the subject for the present. If there be, as there appears to be, serious opposition to those features of the proposed plan which involve the geodetic and land-parceling surveys, why can not the Academy's recommendations as to a Geological Survey be adopted and the remainder be referred to such a commission as the Academy has suggested? The Coast Survey and the Lake Survey can go on with their legitimate work a little longer; and the needed improvements in the system of land-parceling, together with the whole question of the geodetic organization, can be thoroughly discussed and deliberately decided upon. It is not only because of what we have said, but because of so much that remains to be said on all sides, that this course appears to us the wisest.

At all events, we earnestly desire the creation of the National Geological Survey, and we shall welcome the passage of the law which provides for that, whether we are fully suited with its provisions in other particulars or not.

PERSONALS.

The JOURNAL contains four pages extra this week, devoted to coal and iron matters of interest.

Mr. R. S. ALLEN, of the Leadville (Col.) *Reveille*, is registered at the St. James's Hotel. He is having prepared for publication a number of engravings illustrating the mines, furnaces, etc., at Leadville.

Nitrate of soda is the latest discovery. It is said to be found in large quantity in Northern Nevada, and is described as forming the bed of dry lakes, and is similar in its character to the carbonate and sulphate of soda deposits of the same State.

The *Cheyenne Sun* says: "There are 3,000,000 pounds of boilers and machinery here awaiting shipment to the Black Hills." Machine-shops that want business had better advertise in the ENGINEERING AND MINING JOURNAL, that goes to all the mining regions.

The Bullion Club is prospering beyond the anticipations of its warmest admirers. From the character of the membership, the club will exert a very beneficial influence in mining matters. Prof. NEWBERRY gave at the club-rooms, on the 6th inst., a lecture on "Mining and its Mistakes," in which he gave the members some excellent advice.

The transfer of the United States Assay Office at Helena to Mr. R. B. HARRISON (late of the Philadelphia Mint), recently appointed and confirmed Assayer in Charge, took place January 8th, CHARLES RUMLEY retiring. Mr. HARRISON is under instructions from the Secretary of the Treasury to purchase all gold bullion offered, on government account. This will be a great advantage to the Territory and a needed relief to the miners.

AN IMPORTANT LEGAL DECISION AT LEADVILLE, COLO.

Stevens & Leiter vs. Williams.

The importance of a legal decision on the nature of the Leadville deposits lends great interest to the following result of the first great lawsuit, involving some important points. We take this report of the case from the Denver *Democrat* of the 27th January:

The Iron mine, as it is called, was located in 1876 by H. B. Woods, who obtained a patent for it in October, 1877. By his conveyances the ownership of the property was about that time vested in William H. Stevens and Levi Z. Leiter, where it still remains. Within the surface lines of the claim lies the outcrop or apex of a zone or belt of mineral varying in thickness from two or three to ten feet, and carrying iron, carbonates of lead and of silver. This zone lies between two sharply-defined walls or boundaries of rock, the lower wall being limestone, the upper porphyry, and is what geologists term a contact vein or deposit. It descends into the earth in an easterly direction at an angle of about fourteen degrees from the horizon. The hill rises upward at a corresponding angle above the horizon. The vein is one of marvelous richness, and inexhaustible in its extent. Messrs. Stevens & Leiter, in developing this mine, have run

an incline from the surface of the earth downward upon the vein to a distance of 475 feet, the incline in its downward course conforming to the dip of the vein. At intervals of 100 feet, levels have been run from the main incline north and south, all of which disclose the same formation. The incline in its eastward and downward course passes beyond and outside of a vertical plane drawn downward through the east side line of the Iron claim at about 150 feet from its mouth. All the principal developments lie beyond the east side line of the claim, but all of them upon the vein or deposit and between the limestone beneath and the porphyry above. The plaintiffs, in their going outside of their side line, claimed to be justified by the mining statutes of the United States and of the State of Colorado, which, among other things, provides that the patentee of a claim shall have the right to all the premises included within the surface boundaries of the location patented, together with all veins, lodes, or ledges, the top or apex of which lie within such boundaries, throughout their entire depth, though they may so far depart from a perpendicular in their course downward as to pass outside of and beyond vertical planes drawn through the outside lines of the location.

During the summer of 1878, the defendants began sinking a shaft at a point almost 230 feet east of the east side line of the Iron claim and directly east of the mouth of plaintiffs' main incline. On the morning of September 28th, 1878, their shaft penetrated the workings of the plaintiff 200 feet beneath the surface, and about 380 feet from the mouth of the main incline. They barricaded the incline west of the point of its intersection with the shaft, excluded plaintiffs' workmen from all parts of the workings lying east of the barricade, and began hoisting the ore to the surface through their shaft. Plaintiffs filed their bill in equity in the Circuit Court of the United States, asking for injunction and other relief against the defendants. A temporary writ was issued against the defendants last October, on condition that plaintiffs institute proceedings in ejectment against the defendants for the recovery of so much of said mine as was situate to the east of the barricade, which was at once done, and the trial of that case last week resulted in a verdict for the plaintiffs.

The plaintiffs claimed to recover under the statutes above referred to, and the evidence, principally introduced by them, had for its object the establishment of the following propositions:

1. The title to the Iron mine by virtue of a patent issued by the government of the United States.

2. The fact that the top or apex of the vein was contained within the surface boundaries of the claim described in that patent.

3. That the vein or deposit was a vein, lode, or ledge, within the meaning of those words as used in the mining laws of Congress.

4. That the vein in its dip, or downward incline, entered the earth at an angle below a horizontal.

5. That the vein was continuous and uninterrupted so far as it was developed.

6. That the mineral deposit found beyond and to the east of the barricade was the same vein, the top or apex of which was within the surface boundaries of the patent.

7. That the vein was a mineral-bearing vein.

Other subsidiary propositions incidental to those expressly enumerated were also the subject of much testimony.

Maps and plats, vertical sections, etc., were profusely introduced, and the workings of the mine shown in miniature to the jury by means of a glass model, constructed by Messrs. A. D. Foote and C. C. Baldwin, of Leadville, two mining engineers and witnesses in the case. General Francis L. Vinton, a geologist and mining expert of large experience and extensive study, enlightened the jury as to the formation of the country, the general character and distinctive peculiarities of mineral-bearing veins, etc., etc., at great length. The nature of the vein and of the workings were lucidly explained by Messrs. Stevens, Robinson, Houghton, Bates, Trensi, Eads, and others.

The defense made a strong contest, the salient points of which were:

1. The act of Congress never contemplated and was never intended to be applied to a deposit like the one in controversy, and similar ones in Leadville.

2. The deposit was simply a seam of ore found between limestone and porphyry, not dipping into the earth to any extent, but having a rim or selvage in a circular form running completely around the mountain.

3. A deposit of sand mineral is not rock in place, and therefore not the subject of a lode patent.

4. The vein or deposit does not depart from a perpendicular in its course downward, but at an angle nearer a horizontal than a perpendicular, and has an upward rise or pitch to the east of the barricade.

5. The deposit is not continuous, but is cut or faulted at a point just west of the barricade by a quartzite dike penetrating it from the overlying surface.

6. The top or apex of the lode was to the east of and not within the surface boundaries of the Iron claim.

In support of these propositions a large number of witnesses were examined, the most notable of whom were Professor Richardson, Messrs. Nyce, Milburn, William West, Samuel Johnson, and the defendant, James Williams.

The case was managed with consummate ability on both sides, and, it being the first case of the kind from the carbonate camp, the widest latitude was given to the examination of witnesses on each side. The general character and topography of the entire vicinity were discussed, and nothing that could instruct or enlighten the jury was overlooked. The plaintiffs were represented by G. G. Symes and C. S. Thomas, and the defendants by Messrs. Laws & Gunnell and John H. Stimpson.

THE JAMES RIVER & KANAWHA CANAL.—The amendment of Mr. Johnson, of Giles, relative to the sale of the James River & Kanawha Canal to the Richmond & Allegheny Railroad Company, was up before the Virginia Legislature on the 4th inst., and passed by a vote of 66 to 49. The amendment provides that a failure to build the railroad within two years works a forfeiture to the James River & Kanawha Canal. Another amendment was offered proposing that, in case the railroad forfeits the charter, the $50,000 shall revert to the use of the public schools.

SILICON IN BESSEMER STEEL.*

By W. Hupfeld.

Translated by Dr. Thomas M. Drown, Lafayette College, Easton, Pa.

(*Concluded from page* 71.)

The phenomena attending the blowing of highly siliceous irons are quite peculiar. The flame is at first dark-red, increases in length very slowly, is unsteady and flickering. The tuyeres become incrusted badly, sometimes to such an extent that the blast can hardly penetrate. In front of each opening is formed a "nose," consisting of iron and proto-sesquioxide of iron, which I have noticed as long as 400 millimeters. During this formation the quantity of wind passing is constantly diminished, and the blowing-engines labor hard with the increasing pressure. When these projections become very long, the layer of molten iron over them is so slight that the wind passes through it without action. In this case, the flame disappears entirely, the charge becomes cold, and after 30 to 40 minutes' continued blowing, gray or slightly mottled iron can be poured out of the vessel.

The projections dissolve in the bath when, on the appearance of the dark-red flame, the converter is turned down and steel scrap added, and the blast turned on for a short time with the converter horizontal. On turning up the vessel again, the projections are broken off, and the charge, which was before quite cold, becomes suddenly hot, so that in spite of large additions of scrap it must stand 20 to 25 minutes before it can be poured.

All these inconveniences can be avoided by using a moderately siliceous iron, and I can not indorse the opinion advanced by Wedding that the amount of silicon in pig-iron can not well be too high. Two to three per cent is sufficient in every case to make the charge so hot that 10 to 12 per cent of cold scrap can be added, and to attempt more would be only in exceptional circumstances desirable, as when, for example, in absence of steel, a wrought-scrap, cold white iron, low in silicon, to the extent of 15 to 20 per cent, is added to increase the production. Highly siliceous pig-iron requires more fuel for its production; the blast-furnace needs a very hot blast, and its use is accompanied by a greater loss in the converter, without yielding, by way of compensation for this increased cost, a better quality of steel.

The pig-iron, which according to our experience is specially adapted to our practice, is a light-gray or mottled iron with 1·6 to 2 per cent silicon. The course of the process is then sufficiently hot to enable us to add 6 to 7 per cent scrap, and to get a product sufficiently free from silicon by the "direct" process. The end of the blow is indicated by the appearance of the flame, the noise in converter, and, yet more accurately, by the smith's test, which is made for each charge. Turning down the converter, taking the test, hammering the test ingot under a small steam-hammer, hardening and breaking the square bar, and comparing the hardness with a normal scale require altogether not more than three minutes, and even with cold charges this interruption does no harm. Ordinarily the heat is sufficient to allow of two or three tests being taken and the attainment of the desired shade of hardness with nicety. The certainty of this test, as compared with the often deceptive slag-test, has led to its general adoption in Austrian Bessemer works which omit the recarburization, and it has been employed at Neuberg, Heft, and Turrach for some years. Wedding's opinion, that it is not possible during a blow to carry out a regular smith's test, is thus contradicted by the conditions which obtain with us; but may be justified by the experience in Sweden, where a pig-iron is used with but 0·7 to 1·0 per cent silicon. There it would doubtless be impossible during the process to cast 20 to 25 and even 30 test ingots, which, unfortunately, is quite feasible with us.

When our iron has a still higher percentage of silicon—which can be detected by the fracture, and also promptly and certainly by the course of the blow—we abandon the "direct" process, blow the steel soft, and add the requisite amount of cold spiegeleisen. As much as 200 kilos. can be melted without difficulty, though we seldom need add more than 75 to 100 kilos.

Finally, as to the effect of silicon on steel for different uses, it is natural that those masses which, after rolling, have not to be further treated, can contain, without injury, more silicon than those which are subsequently to be worked into finer articles. For rails, for instance, 0·6 per cent is absolutely harmless; for they will, with this amount, stand the prescribed vigorous blow, bending, and weighting tests. It was going too far, therefore, when a railway management recently proscribed rails with more than 0·1 per cent silicon, and considered a much higher content of phosphorus harmless. For shafts, beams, and angle-iron, the same is also true.

Boiler-sheets are more sensitive, and we must here hold to a lower limit, as well as for tool-steel and steel for cutting instruments of all kinds; but, even in these cases, silicon in amount of 0·1 to 0·25 per cent would appear to be wholly without objection; for we have found, for example, in one of the most celebrated varieties—crucible steel for scythes—0·214 per cent silicon, together with 0·55 per cent carbon and 0·42 per cent manganese.

I have in view the determination of the tensile strength of these steels, for which I have not as yet had the time.

A BILL TO LIMIT MINING CLAIMS BY THEIR SURFACE LINES.

WASHINGTON, February 6.—The bill introduced in the House of Representatives to-day by Mr. Patterson, of Colorado, to amend the mineral land laws, possesses great interest for miners and owners of mines in Colorado, including some of the largest which are controlled by Eastern capitalists. Section 2322 of the Revised Statutes provides that the "locator" of a mineral vein may follow the vein wherever it leads, even though in following it downward it should pass outside of the limits of his location boundary lines into and across the mining claim of another. When this section was adopted, all known veins or lodes extended downward in an almost vertical line, or at least with a very slight dip from the vertical. Hence, but little injury could be done by the law. The late discoveries in Colorado are unlike any previously discovered lodes in position and strati-

* From the *Zeitschrift des berg- und hüttenmännischen Vereins für Steiermark und Kärnten*, September, 1878.

fication. Instead of extending downward in an almost vertical line, these new lodes are almost horizontal, and extend for miles only a slight distance under the surface. The first "locators" now claim that they have the right to follow their lodes, even for miles. Mr. Patterson says if this claim is sustained, the entire mineral deposit referred to will pass out of the hands of several thousand miners who have made locations, and into the hands of a few wealthy corporations and other combinations of individuals, to the great injury of the community. He has, therefore, introduced, and will urge for passage, this bill, which provides, in regard to all mineral lodes located in Colorado since the 1st of January, 1876, or hereafter located in that State, where the lode is horizontal, or has an average dip not exceeding 40 degrees, the "locators" shall not be permitted to follow the lode outside of the vertical limits of the surface boundary lines, even if the apex of the lode lies outside of such vertical lines. The bill was referred to the Committee on Mines and Mining.

THE COPPER PRODUCTION OF LAKE SUPERIOR MINES.

We are indebted to Mr. Charles E. Wright, Commissioner of Mineral Statistics for Michigan, for the valuable table from which we take the following. Mr. Wright's table includes the production of all the mines from 1855:

STATISTICAL TABLE SHOWING THE TOTAL NUMBER OF NET TONS OF REFINED COPPER PRODUCED BY THE MINES OF MICHIGAN.

By CHARLES E. WRIGHT, M.E., Commissioner of Mineral Statistics.

NAMES OF COPPER MINING COMPANIES.	1874		1875.		1876.		1877.		1878.		Totals from 1855 inclusive.	
	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.	Tons.	Lbs.
1 Adventure.	3	165	15	470	20	784	32	609	27	115	566	1,638
2 Ætna.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	881
3 Albany & Boston.....	.....	.....	.....	.....	3	15	5	1,998	.....	4,746	440	36
2 Allouez.....	a 504	134	a 692	1,574	a 780	1,875	a 650	279	493	796	3,133	1,396
2 Amygdaloid.....	7	1,840	.....	.....	.....	.....	.....	.....	.....	1,259	770	1,180
3 Arcadian...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	409
3 Atlantic, South Pewabic.....	686	406	783	1,036	917	1,041	1,019	1,226	1,021	1,873	6,641	587
1 Aztec.....	6	1,412	8	252	13	1,378	14	1,934	11	1,392	340	1,240
2 Bay State..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	199	1,115
1 Caledonia, Old Nebraska, b.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	131	688
3 Calumet & Hecla.....	10,062	1,225	10,736	1,954	10,845	737	11,284	468	12,537	782	97,497	760
1 Carp Lake.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	1,135
2 Central....	870	900	733	952	1,080	1,400	937	1,810	945	1,013	12,597	1,941
2 Clark.....	3	1,244	33	1,475	19	774	17	813	10	1,520	93	1,573
2 Cliff.....	526	901	581	873	450	146	80	1,319	207	415	18,622	1,236
3 Concord...	11	518	.....	440	.....	.....	.....	.....	.....	.....	327	1,544
2 Copper F'ls	535	359	203	1,587	8	1,488	5	1,950	5	1,790	6,750	1,512
2 Delaware..	40	1,271	12	1,220	88	1,701	16	1,417	140	315	601	1,050
3 Douglass...	.....	.....	.....	.....	.....	.....	1	1,258	.....	.....	84	1,502
2 Eagle River	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	24	1,667
1 Evergreen Bluff.....	.....	.....	.....	.....	.....	.....	.....	.....	35	1,873	409	1,833
1 Flint Steel River.....	24	772	16	1,054	15	115	13	67	19	356	377	1,046
3 Franklin...	283	1,700	583	800	963	641	1,169	1,817	1,178	172	11,500	914
2 Garden City.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	37	1,397
3 Grand Portage.....	.....	.....	.....	.....	.....	.....	.....	.....	17	194	797	209
3 Hancock, Sumner....	a 30	1,365	a 11	229	.....	.....	.....	.....	.....	.....	1,298	7
1 Hilton, O...	.....	.....	.....	.....	.....	.....	1	1,555	3	807	20	1,789
3 Houghton, Huron.....	a 125	1,005	a 31	1,289	a 31	1,857	a 41	161	32	1,100	3,797	386
1 International, Bohemian....	3	1,535	4	762	5	653	8	1,703	.....	1,488	216	58
3 Isle Royale.	a 90	876	a 48	982	a 14	199	a 15	1,985	15	1,933	4,485	829
4 Island.....	.....	.....	.....	.....	24	340	41	867	.....	.....	68	1,207
1 Knowlton.	3	215	3	562	.....	.....	2	1,975	4	629	263	973
1 Lake Sup'r.	2	1,228	.....	.....	.....	.....	1	106	.....	.....	6	1,735
2 Madison, Summit....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,676	35	557
1 Mass.....	5	1,925	1	1,014	40	1,952	54	238	148	1,634	340	543
3 Mesnard...	.....	.....	.....	.....	.....	.....	3	589	.....	.....	42	97
1 Minnesota.	93	338	66	1,419	44	954	56	1,148	87	1,027	17,263	996
4 Minong....	.....	.....	24	344	57	537	52	892	45	596	179	389
1 National...	71	52	49	878	83	647	34	737	11	736	5,165	732
1 Nonesuch..	13	1,450	24	1,067	.....	.....	.....	.....	.....	.....	42	137
2 N. Amer'n.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	976	1,804
2 N'hwest'n..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	199	213
1 Norwich...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	496	1,360
1 Ogima.....	.....	.....	.....	.....	.....	.....	.....	.....	1	800	460	345
1 Ohio Trap Rock.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	1,185
3 Osceola....	468	.....	665	393	846	1,737	1,382	777	1,228	1,700	4,586	517
2 Pennsylvania, N. W..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,517	302
2 Petherick..	86	291	76	946	42	1,224	7	633	.....	.....	343	424
3 Pewabic...	147	607	312	1,271	284	995	246	1,777	261	1,826	10,643	1,314
2 Phœnix....	699	400	702	276	698	530	511	493	150	1,172	5,763	1,340
2 Pittsb'g & Boston.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	994	1,138
3 Quincy.....	1,525	654	1,399	281	1,536	1,171	1,427	336	1,480	449	23,175	675
1 Ridge.....	187	113	164	447	145	18	148	815	125	1,837	1,956	953
1 Rockland..	22	1,260	5	1,440	28	1,600	19	700	8	1,877	3,104	385
3 Schoolcraft	a 5	618	.....	.....	.....	.....	.....	.....	.....	.....	941	529
2 Seneca.....	.....	.....	.....	.....	.....	.....	3	1,810	3	1,809	8	1,222
3 Shelden & Columbian	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,622	673	463
4 Saginaw...	.....	.....	.....	.....	.....	.....	.....	1,800	.....	.....	.....	1,800
5 Star.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	1,180
2 St. Clair...	2	1,400	.....	.....	.....	.....	.....	.....	.....	.....	220	939
1 Superior....	.....	.....	.....	.....	1	1,636	2	1,870	.....	1,965	282	1,855
1 Toltec.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	206	1,433
1 Victoria, Forest....	.....	.....	.....	.....	.....	752	.....	861	2	52	186	1,279
1 Windsor...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34	.....
Sundry Co.'s & tributers	16	1,120	24	.....	41	1,800	27	1,000	2	186	873	1,148
Total No. net tons & lbs..	17,166	1,389	18,019	1,497	19,135	997	19,505	1,593	20,266	492	253,035	659
Total value. N. Y. City..	$7,553,000		$8,109,000		$8,033,000		$7,408,000		$6,628,000		$123,394,000	
Highest and lowest price	25—19		23¼–21⅛		23—18¾		20⅝–17⅛		17⅛–15¾			

1 Mine in Ontonagon County. 2 Mine in Keweenaw County. 3 Mine in Houghton County. 4 Mine in Isle Royale County. 5 Mine in Houghton and Keweenaw counties. a May 1st of following year. b Produced copper previous to 1863.

According to Dr. Deite, most of the French manufacturers of iodine who buy their weed-ash from the varec-burners obtain only 3·15 kilos. of iodine from a ton.

MINING IS A LEGITIMATE BUSINESS TO THOSE WHO MAKE IT SO.

By J. E. Clayton, M.E.

SOME EXCELLENT PRACTICAL ADVICE.

Allow me to congratulate you for the general course you have pursued in commending good, legitimate mining enterprises, and especially for your fearless exposures of mere stock-gambling (swindling) schemes, gotten up to rob the unwary and uninformed public in the name of legitimate mining. It is truly gratifying to the *bona-fide* miner, to know that they have so able and fearless an advocate of their chosen industry as the ENGINEERING AND MINING JOURNAL, and every honest mining man throughout the length and breadth of this great republic bids you God speed in your noble work. Your double task is arduous and difficult. First, the advocacy of legitimate mining in all its varying branches, and more especially that part relating to the reduction of the ores of the useful and precious metals, requires a vast amount of labor, research, and personal knowledge. Secondly, to protect honest mining industry and its related metallurgical operations requires a high order of moral courage, wise discrimination, and fearless disregard of the stock gamblers, unscrupulous schemers, and jobbers in worthless mining stocks. So far you have done well. You will be able, no doubt, to meet the leading requirements of mining industry in all its legitimate branches, and do a great and noble work in guiding and directing capital and labor in legitimate channels for the establishment of mining enterprises upon true business principles.

The second part of your task is more difficult. It often happens that wild-cat speculations are foisted upon the public, and the mischief done before you become aware of the facts. Our mining districts are spread over such a vast expanse of territory that no journal can possibly know the facts in time to warn the public against dangers coming from a thousand distant points, north, south, east, and west; for the attack upon the public credulity is made in front, rear, and on both flanks.

In such case, all you can do is to keep up a general fire at the public enemy as it were from a revolving steel-clad turret, and when some bush-whacker, more bold than his fellows, exposes himself, a little sharp-shooting at long range becomes a wholesome exercise.

You have made some handsome "scores" in that line already, and with practice you will establish a great reputation as an expert in the use of "arms of precision" at long range. Don't misunderstand me, please. I am not giving you directions how to "run" a mining journal; I only want you to understand that some of the difficulties of your work are known and appreciated by every intelligent mining man, and that you have at least my hearty sympathy, and upon all proper occasions my co-operation.

It would be a good work for our mining engineers all over the country to coöperate with the ENGINEERING AND MINING JOURNAL in giving timely warning to the public against every plundering scheme, gotten up by unscrupulous middle-men in the shape of stock speculations that have no legitimate foundation. Many of our engineers and experts are afraid to do this. They think it would ruin their business, and there is too much truth in this objection; but, in my opinion, it is the best way for any honorable mining engineer to establish a reputation for reliability, capacity, and truth. He should set his face firmly and persistently against every attempt to deceive the public as to the true merits of mining properties. He would thus gain and deserve the public confidence, would enhance the value of mining industries, based upon true business principles, and make for himself a name worthy of his profession.

Mining is a legitimate business to those who make it so. It is a gambling lottery business to those who engage in "floating" or in dealing in worthless mining stocks. It is well known to mining men that a large majority of the mining stocks offered for sale in the Eastern States is utterly worthless as a legitimate investment.

Who is to blame for this deplorable state of facts? The question is easily answered.

First, there are sharp, unscrupulous men in all mining districts who have claims—or can easily get them—out of which no money can be made by legitimate working. They get favorable reports, rich samples of ore, and artistic maps, etc., and go East.

Second, there is no place in our wide domain where the same class of sharp, unscrupulous men are more numerous than in our Eastern cities. The Western and Eastern sharpers naturally gravitate toward a common object—to get an unearned living out of the public. Your readers well know the "methods" resorted to in "roping in" respectable names, to aid in "floating" the stock. I will not take up your space in reciting the smooth and fair-seeming "methods" of these gentlemanly explorers of Eastern pockets, but I will say this much. If Eastern men were not so ready to engage in stock gambling, mining as a business would be in much better repute among Eastern business men.

Your review of the New York mining stock market during 1878 is an able and interesting paper that makes many good "hits" and wise suggestions. In fact, it ought to be carefully read by every business man who contemplates engaging in mining industries. To such men I would commend the Ontario mine as an example for them to study. Its history is a good illustration of a legitimate mining enterprise. First, they secured the mining claim from the locators or owners without the intervention of "middle-men." Second, they went to work and explored the mine with their *own money*, until they had enough ore in sight to enable them to guarantee regular dividends. Third, they then made a plain, straightforward statement of the facts developed by their workings, backed up by an equally straightforward report made by a disinterested mining engineer, well known to the public. Fourth, then they offered part of the stock to the Eastern public, at prices not exceeding the values in sight. The results are that it has in two years paid dividends equal to the sum originally asked for the stock, and has to-day the best record for careful, business-like management of any mining enterprise on the Exchange lists. This enterprise has been organized and managed by Western men, who make mining a "legitimate business." Can any company organized and managed by Eastern men give such a fair and business-like record? I don't know one.

Eastern methods are different. They "put the cart before the horse." They buy their mines from middle-men without proper investigation. They work their mines in the East (on paper), and flood the market with

stock that can not in the very nature of things pay any dividends for years, if at all. Their management is cumbersome, slow, expensive, and generally inefficient, culminating finally in disaster. Is it any wonder that our Western miners will not sell a *good* mine to an Eastern company and take even a part of their pay in stock? Does the history of Eastern stock companies warrant them in so disposing of a good paying mine? No. The average Western miner will tell you: "I have a good claim, and know it. If you want to buy it, put up a fair price in cash, and you can have it. I don't want your stock. I have no confidence in your management. Your stock won't buy me an outfit for another prospecting trip, or food for my family. No, thank you; I will keep my mine until I can get a fair price in cash."

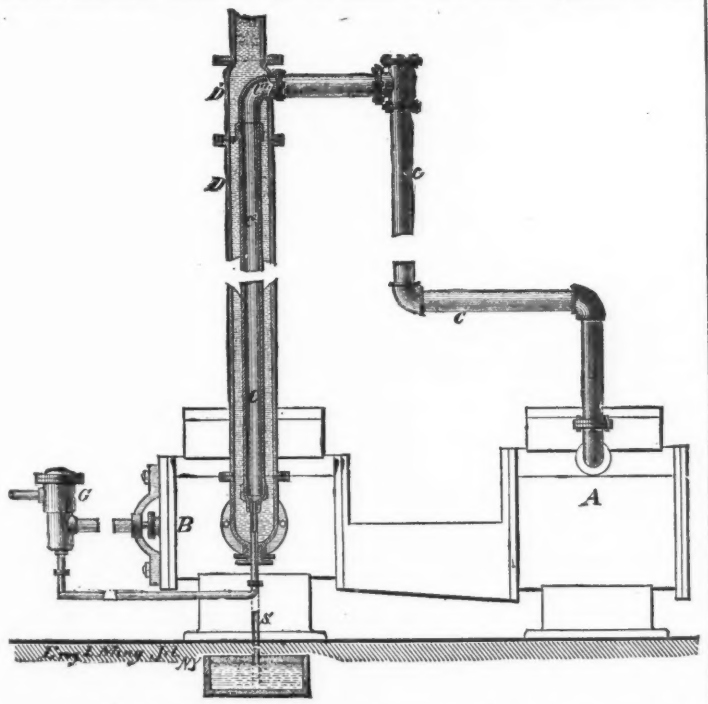
If a miner has a claim that won't pay to work in the small way, the chances are that he will readily "bond it" to some middle-man to take East, agreeing to take most of his pay in stock, especially if it is a "true fissure vein," for he well knows the importance that Eastern men attach to the "technical name" given to the mine. It must be a true fissure; therefore exhaustless. It don't matter if the ores are a little "lean" on the surface; it is sure to get richer as you go down, and widen out, too. It won't do to stock this magnificent prospect for less than $10,000,000; there wouldn't be enough to go around and leave margins for the "floaters," etc., *ad nauseam*.

In conclusion, I wish to say to our Eastern friends, that the technical name of an ore-deposit has nothing whatever to do with its value. True fissure veins are as liable to be pockety or barren as any other class of ore-deposits. The only common-sense rule by which to estimate the value of any mine is to measure the quantity and test the value of the ore. The best mines are those that yield the largest quantities of rich ore at a minimum cost; and always bear in mind that *mining is a legitimate business to those who make it so.*

SALT LAKE CITY, UTAH, January 18, 1879.

CRAIG'S AUTOMATIC SURFACE CONDENSING APPARATUS FOR STEAM PUMPING-ENGINES.

Engineers, more especially mining engineers, will appreciate the value of a good condensing apparatus for steam-pumps and pumping-engines, not only for the purpose of getting rid of the nuisance of exhaust steam, but for the large additional power added to the steam cylinder of the



pump, enabling the work to be done at greatly reduced steam pressure; especially if the apparatus is automatic, simple, compact, and not liable to get out of order.

The above illustration represents a longitudinal view of a steam-pump having the invention applied. *A* is a steam cylinder of the pump, here shown to occupy a horizontal position, and *B* is the water or pumping cylinder. The pump may be of any of the usual reciprocating piston, plunging, or rotary styles. *C* is the exhaust-steam pipe of the steam cylinder *A*, and *D* the water discharge-pipe of the cylinder *B*. The pipe *C* is here represented as projecting upward to any desired height and connected to the nozzle C^1 of the discharge-pipe *D* of the pump *B*. Connected to the nozzle C^1 is a downward extension of the exhaust-steam pipe C^1 projecting down within, and is surrounded by the discharge water pipe of the pump *D*, and may be connected at its lower end by a small pump *G*, as shown in the engraving, to draw off the water of condensation caused by the condensation of the exhaust steam flowing through the exhaust-pipe of the engine (through surface condensation) consequent on the flow of water up the stand-pipe *D* around the outside of the exhaust-steam pipe *C*. The small pump *G*, when used, provides for giving off in the shape of pure water all the steam used by the steam cylinder back to the boiler, very desirable in mines where the water is generally impure. The pump *G* may in the majority of cases, as in mines, be entirely dispensed with by carrying the small pipe *S*, as shown at the lower end of discharge pipe *D*, a sufficient depth to support within it a column of water corresponding to the vacuum required, said small pipe having a small reservoir, as shown below the pump.

Although the engraving represents the apparatus in a vertical position, it may be applied obliquely, horizontally, or in any position to suit the situation.

The advantages to be gained by attaching a condenser to a steam-pump are much greater than seems possible at the first glance; for example, steam-pumps are usually constructed with steam cylinders from three to four times larger in area than the water cylinder; and say we have a vacuum equal to about 13 pounds pressure, which vacuum has the large piston of the steam cylinder to act upon; and suppose we take a pump of the following dimensions: 12-inch diameter of steam cylinder, and 6-inch diameter of water cylinder, pumping, say against 80 lbs. pressure; the steam piston will have a pressure of, say, 25 pounds above the atmosphere upon it; allowing 5 pounds of this to be used up in overcoming the friction of the pump and the other 20 pounds are left to perform the work. The condition of the pump, if a condenser were attached, would be as follows: 13 pounds of steam would have its place taken up by the vacuum; consequently 12 pounds would be sufficient for the working of the pump. This is a direct saving of 52 per cent when pumping at 80 lbs. pressure in the water cylinder.

The extreme simplicity of this condenser is such that it can be taken care of by those not at all conversant with the details of a condensing engine, having neither cocks nor valves of any description, and being automatic in its action. By its application to the discharge-pipe of the pump, it is entirely free from any interference with the working parts of the pump, as most all condensers hitherto in use have failed to give that entire satisfaction required, through their interference with the action of the pump in breaking the column of water in the suction, thereby enfeebling the action of the suction-valves and causing the pump to jump at each end of the stroke, if not regulated with considerable skill and attention, to the injury of all the working parts of the pump, diminishing the amount of work performed by the steam cylinder, defects which it has long been the aim of engineers to remedy.

It will be seen that this condensing apparatus is not only applicable to pumps running in mines, but also to pumps supplying buildings of various kinds with water, and is especially applicable to oil-line pumps, converting them at a small cost into condensing or low-pressure pumping-engines, enabling them to do the same work at greatly reduced boiler pressure. The cost of the apparatus is from $60 to $110.

THE ORIGIN OF METALLURGY—THE BRONZE AGE.*

I.

We are ignorant as to the date of the first appearance of mankind; we have no foundation upon which to rest the chronology of the primitive times. History dates only from yesterday, and yet, among the different nations, presents but fabulous origins. There is no more reality in the first facts related by Titus Livy than in the genealogies of the Grecian heroes. Adam and Eve are an agreeable myth, borrowed, perhaps, from Persia in the times of captivity; their descendants are the personification of families or of tribes. Grecian chronology goes back about six thousand years prior to our era, but is likewise preceded by a long mythological period. The same may be said of India and China. After all, what are six thousand years? Already have a hundred passed since the French revolution, and does it appear long to any one? Nowadays events follow each other very fast and progress is rapid, because we possess forces, both physical and moral, of enormous power, by means of which we transform the earth and ourselves. When our ancestors possessed them not, their advances were slow, their achievements small and casual. How can the ocean be traversed, or a large sheet of water crossed without boats, and how can we construct boats if there are no tools of iron—or some substance sufficiently hard to work wood—to adapt the pieces, and render them impermeable to water? Let us consider the objects we make use of to-day to clothe, shelter, nourish, and convey ourselves from place to place, to procure light, heat, books, and so many products of science and art which adorn our households. It will readily be seen that there is not one which does not suppose the possession and successful employment of the metals. We are now all aware that men have not known them at all times. For a great number of years they did not possess any, except, perhaps, a few grains of gold which nature spontaneously gave them, and which they collected here and there on the banks and in the channels of rivers. It was this period which has been called *The Stone Age*, and the tools those unfortunate men have left behind them, as evidence of their industry and necessities, are all made of hard stone, of silex, of diorite, of obsidian, and of trachyte. This long period of the infancy of man is attested by the strata in which these objects are found, buried beneath mounds of earth which have required centuries for their formation; but the actual geological period had not yet begun when man was already in existence, living among mammoths, bears in caves, and other animals now no longer to be found. In the first place, it was necessary that a man, having selected a stone on which to put an edge, should strike it with another in order to scale it. Thus were the first hammer and the first hatchet made; and all other instruments being made in like manner, have given the name of *The Period of Unpolished Stone* to the era during which this rudimentary industry lasted. Little by little it was found that certain stones could, by means of continued rubbing, wear others, which were even harder, and so friction was substituted for percussion in the manufacture of tools. In this way sharp hatchets and scissors were made; round, hard stones were bored, and handles inserted. Smaller stones, of finer quality or brighter color, were shaped and pierced, and then used as beads. Arms were made in the same way. It was this second period of humanity which has received the name of *The Period of Polished or Neolithic Stone.*

From the beginning—or at least from an early date—men attempted to mold clay into uses of different kinds. This work was done by hand during the entire age of stone. The potter kneaded the clay with his fingers, the impression of which is yet seen on the pottery of those early times. It required constant observation and new means of action to enable the potter first to discover the value of the movement of a wheel, and then to construct one. In fact, the turning-lathe seems to have been unknown during the whole period of which we speak; but the baking of vases dates far back; for, from the time that men could light fires, they

*Translated for *Van Nostrand's Magazine*, from the French of Emile Burnouf, by Christopher Fallon, A.M.

observed on their hearths pieces of argil become insoluble by the heat. The black, red, or yellow clay which nature furnished them in many places enabled them to color or paint these roughly-made vases; they then polished the surface, yet soft, by means of a stone burnisher, and engraved fantastic figures thereon.

Then came the first metal, which, let us say, was the common metal, copper. The knowledge of gold certainly preceded that of brass, because gold is found in its natural state in many countries. It no doubt was the same with silver, the extraction of which is not very difficult; perhaps the same should be said of lead; for from the time globules of metal were found in the ashes of the fire, the man who noticed them must have wanted to know the ore from which it was extracted, and, having found it, must have sought for more in the mountains.

Substances which are producible in hearths, by the mere burning of minerals, must have been first discovered, as lead and glass; artificial glass, usually blue, is found among the objects of personal ornament of the most ancient times. On the other hand, when the extraction of a metal requires a high temperature, or a chemical operation, it may be conceded that such a metal was discovered long after the others and after a number of ineffectual attempts. Copper is found native, but in very small quantities; copper pyrites resembles gold; still the metal is obtained only by complicated operations, as is the case also with tin. Finally, after obtaining these two substances, it is necessary, in order to form bronze, to make a fusion—which is attended with difficulties. The bare idea of uniting two metals does not readily present itself to the mind, and when once conceived, it is yet essential to learn in what proportions they must be used in order to form a new metal, more useful than either.

Bronze appeared in the West when the art of polishing stone had arrived at a state of perfection. We have in our museums instruments of hard stone made anterior to the appearance of bronze, which our own workmen could not make better nor in any other manner; only they would probably make them faster, for they have means of action and processes which the ancients did not possess. Bronze, at first scarce, became more common in the course of time. Those fabricating it could dispose of it in other countries only in exchange for other objects of the same value but of a different kind. These objects of exchange caused a demand which could be supplied only by discovery, or by obtaining them elsewhere in sufficiently large quantities to give rise to commerce. The discoveries of which we are about to speak have proved that the quantity of bronze kept increasing; that with this new metal many instruments were manufactured which were previously made of stone, that new ones were invented; and that a time arrived when the substitution of bronze for stone was, so to speak, complete.

The Bronze Age was for a short time co-existent with the period of polished stone. There is then a period of transition, when these two substances were, in a measure, blended together, and might be comprised under the same title in the age of stone or in that of bronze, It would be a mistake, however, to suppose that metal caused the hard stone to disappear entirely when the superior qualities of the former were discovered, as stone continues to be used for many purposes in many countries where neither bronze nor even iron has as yet supplanted it. Thus those small double-edged blades made of obsidian or silex, known as knives, still in use in the Grecian peninsula, in Asia Minor, in Palestine, and no doubt in many other countries, are fastened to pieces of wood and used by the peasants to thrash their wheat or cut their straw. They are of the same shapes as in the bronze age, and are made in the same way; but the predominance of metal over stone, and the abandonment of the latter in most cases in which it was employed, characterize the long era which followed that of transition and which constitutes the bronze age properly so-called. In the same way that this metal was substituted for stone, it happened that a new metal concurred with bronze, and was used instead wherever there was a decided advantage in so doing.

Discoveries which were made only twenty years ago, and which since then have been repeated throughout Europe, have enabled us to fix the period of transition from bronze to iron. It differs from that which has been called the first age of iron, and which has, for a long time, been well ascertained. During the latter, iron already takes the first rank, and waits only to be brought to a state of perfection. The transition period is marked by a slow and progressive substitution of the new for the old metal, and by a reciprocal influence from one to the other. When iron first appeared in Europe, it met the same fate which bronze a few centuries previously had experienced. It was a rare and precious substance, and lost its value only by its increasing abundance, and when it could be converted into tools, utensils, and arms, which were formerly made only of bronze. The oldest objects of iron found are bijoux and ornaments; for even in those early times there were rich and poor men, and those alone could obtain articles of iron who had other valuable objects to exchange. Do we not see the same thing in our own day? We assisted, a few years ago, if not in the discovery at least in the economical extraction of aluminium. This metal, until then confined to laboratories, became an industrial product; but as the preparation is yet expensive, it is worth twice as much as silver, and is employed in making ornaments and fancy articles. Yet it is not less common than iron in nature; it is the base of all clays, and possesses qualities which can—which ought to make it preferable in certain cases to silver, to brass, or even to iron. It needs but new processes of extraction to render it as abundant as the latter.

Iron has not entirely supplanted bronze, as the latter is still much used, nor would aluminium and all the other metals cause iron to be abandoned; but a new substance may answer many purposes better than those that have preceded it, and for this reason be preferred. For a long time hatchets were made of stone, but were set aside when they could be made of bronze; bronze hatchets were the only ones to be found for many centuries, but were also abandoned when iron ones became sufficiently abundant to compete with them in the market. The period of transition from bronze to iron is well characterized in many ways, of which we shall speak hereafter. There is no doubt, at present, of the reality of this change, and it is even becoming apparent how this transition was accomplished, and the course the metals have taken to spread from one mart to another, until they have reached the most remote countries of Northern Europe; but before exhibiting these grand discoveries of our day, I must give an account of the progress which science has made in the study of ages anterior to any history.

II.

We need not here repeat the list of discoveries relative to the age of stone and to the men of those primitive times. The *savants* of the first empire and of the restoration had denied the existence of what was then called the fossil man. Science and religion united in discrediting even the mere possibility. The discussions which arose when Boucher de Perthes announced the discovery of the remains of such a man in the old alluvia of one of the northern departments, have not yet been forgotten. His discovery was followed by the sarcasm of some and the fanaticism of others, until the day when a new generation of *savants* recognized their authenticity. A short time afterward, skeletons of fossil men and remains of their works were found on all sides. The name of Lartet is connected with the exploration of the caverns of Perigord and Languedoc; those of Tomsen and Wilson with the prehistoric antiquities of Denmark; and that of Keller with the lacustrine habitations of Zurich. Since then, Boucher de Perthes is regarded as the originator of a new science, which forms the connecting link between the geology and archæology of historic times. This science, though of recent date, is already possessed of a great number of observed facts, is methodic and well defined, and its general results are already perceived. Among those who concurred in these first developments there will be found very few erudite men; they are mostly scientific men, geologists, physiologists, engineers, chemists, and perhaps amateurs who delight in this science as a pastime to beguile their leisure hours away. Texts were for a long time the only means of investigation; but the most ancient texts are, in reality, modern, if their age is compared with those long periods which mankind in its infancy passed over. The most ancient Grecian authors, those who, under the real or fictitious name of Homer, have bequeathed the Iliad and Odyssey, lived in the iron age; they related events which occurred many years before, and if real, were accomplished, according to all appearances, in the bronze age. This does not prevent the author of the Iliad, and especially of the Odyssey, putting iron in the hands of his heroes; thus the poets attributed to the past what was before their own eyes, but which the past never knew. Egypt had not yet begun to furnish those documents which are now being found; it was not known that the first four dynasties at least are anterior to the knowledge of iron in that country. The hymns of the Veda, to serve as scientific documents, should, in the first place, be classed according to a chronological order and referred, if possible, to certain and determinate epochs. India seems far from being able to throw any light on this subject. As to Genesis, it is known that its origin is a matter of discussion among the learned, and if some, true to their faith, attribute it to Moses, others reject its authenticity, and consider it as formed by the union of two opposed traditions in one book. Be it as it may, and admitting the authenticity of Genesis, it is at least certain that its author had little knowledge of the bronze age, and still less of the stone age; for it is said that Tubal Cain, the first metallurgist who is mentioned, "was maker of all sorts of instruments of brass and iron." In fine, the ancient authors can not have had correct ideas of the primitive times, composed perhaps of decades of years when writing was not yet in existence. It is possible there were traditions handed down from year to year; still the passage from the *Prometheus* of Æschylus, in which mention is made of the first men, of their living in caverns, and of the discovery of metals, is too vague to serve as a basis for scientific induction. In fact, the ancients were not in a situation so advantageous as ours with regard to the past, which there were no documents to record, as they neither had the means we possess, the innumerable facts which all the countries of the world can furnish, nor the capacity of acting in concert, as now throughout Europe, by means of communication and typography.

The Greeks made no underground searches. The Romans robbed a great many tombs, not through love of science, but to obtain the valuable objects therein, which have been reburied or have disappeared with them. The Roman Church, which followed the empire, has never favored the positive sciences. The middle ages were taken up with metallurgy, but their end was that of King Midas; the philosopher's stone was to convert all the metals into gold. The modern spirit, which may properly be called the scientific spirit, after having learned with Bacon and Descartes its real rudiments, has steadily advanced in a series of discoveries. Possessed of the abstract sciences, it has been able to unite conjecture with reality, and found natural philosophy and chemistry. It then gave birth to that new study whose subject is human beings; to the physiology of plants, of animals, and finally to the science of man, of which prehistoric archæology forms the first chapter.

Farmers and workmen had for a long time known of the existence of instruments of bronze, and had gathered and sold them before the *savants* thought of collecting them and organizing a museum. The first collection made was that at Copenhagen. It was Thomsen who, as early as 1836, classified all objects dug from the dolmens, barrows, and mounds of Denmark, and founded the Museum of Northern Antiquities—the finest prehistoric collection in Europe. A certain Swede—Sven Nilsson—profiting by Thomsen's work, and by his own knowledge of the barbarians of Oceanica, and of other countries not yet civilized, united their industrial works with those of the ancient Danes, and, from 1838 to 1843, introduced the study of comparative ethnology. It is not to be supposed that the savages of to-day are descendants of the ancient inhabitants of Europe; but their ways of life are the same, and they make use of the same means to satisfy their wants. There now exist colonies which do not know the use of metals, or which obtain them in small quantities, and look upon them as objects of personal ornament. They have nothing to exchange in commerce with the rest of the world.

It was Thomsen and Nilsson who distinguished the stone age from the bronze age. They had found in the Northern countries a certain class of tombs in which, besides skeletons and rough pottery, objects of stone are found, but there were no traces of any metal. In others, bronzes were found to have served the same purposes as stone, and to have been substituted. In others, again, appeared articles of iron almost similar in form to those of bronze in the other graves. It is evident that if the men of the first period had had bronze, they would have used it in preference to stone, while those of the second would have put aside bronze for iron.

(TO BE CONTINUED.)

EXPORTS FROM GREAT BRITAIN AND IRELAND TO THE UNITED STATES.

The following is a list of the exports of articles of most interest to our readers, from the United Kingdom to the United States, during 1878, as compared with 1877 :

	1877.	1878.
Copper, unwrought, cwt.	100	40
" wrought, "	1,049	773
Hardware and cutlery	£322,843	£301,479
Iron, pig, tons	35,953	32,671
" bar, angle, bolt, and rod, tons	5,877	4,698
" railroad, tons	2,525	922
" hoop, sheet, etc., tons	5,079	1,020
" tin plates, tons	106,593	108,124
" cast or wrought, tons	2,413	3,193
" old, tons	3,167	1,889
Steel, unwrought, tons	6,263	4,901
Lead, pig, rolled, etc	2,904	377
Machinery	£166,608	£141,059
Salt, tons	233,661	230,553
Tin, unwrought, cwt.	30,533	13,195
Earthen and chinaware	£619,050	£558,016

Tin plates and cast or wrought-iron are the only items showing an increase in 1877 over 1878. Although 1878 was a year of very great depression in the United Kingdom, yet the total exports amounted to £192,804,334, a decrease of but £6,088,731. The imports, however, show a falling off of £28,214,296, having been in 1878, £366,059,610, and in 1877, £394,273,906.

PROSPECTING.

The clever sketch below, from the skillful pencil of Gen. Francis L. Vinton illustrates a familiar scene in Colorado. It has also the additional interest of representing well-known citizens. The prospector "panning out" the gold is Mr. Ebert, well known in Colorado. "Our Special" sits on the right. The scene is on one of the gold-bearing bars at the headwaters of the Blue.

NEVADA NOTES.

An occasional correspondent writes :

"We notice with great pleasure the growing interest in mining matters in the East ; only look out that the Frisco stocks do not stick you. There is a very lively interest here in the proposed sticking of Eastern people with the regular assessment stocks, and parties look to a short but lively spurt in consequence for February and March. I think it likely that it will come ; for the Eastern man is just as fond of dabbling and gambling as the Western man, on an average, only a little more inexperienced or green in the bluffing portion of the game. I hope the ENGINEERING AND MINING JOURNAL will protect him.

"With regard to the Tuscarora mines—Independence, Navajo, Grand Prize, Argenta, etc.—you are on the right track ; they are said to be made a see-saw of by a person who has long been in that business, and who has now on hand a lawsuit for ore taken out of the Alpha ledge, and from which he declared dividends on the Rye Patch. He is puffing up 'Paradise' now."

MARINE-ENGINE ECONOMY.—One of the most suggestive illustrations that can be adduced as showing the advances made within the last forty years in marine-engine economy is derivable from an examination of data of recorded averages of Atlantic steamships ; and more especially of those of the Cunard paddle-wheel steamer Britannia, in 1840, and the White Star Screw steamer Brittanic in 1877. Of the first vessel the average duration of passage was fourteen days and eight hours, and the consumption of fuel 544 tons, the daily consumption thus being 38 tons. Assuming the average cargo at 225 tons, this gives 48·35 cwt. of coal per ton of cargo ; and the average speed in knots per hour being 8·3, the consumption per knot was 3·8 cwt. The indicated horse-power was 740, and consumption per horse-power, 4·7 cwt. The Britannia displaced but 2050 tons, and this must be taken into account in comparing her with the Britannic, whose displacement is more than four times as great, or 8500 tons. That vessel, in 1877, showed an average passage of seven days ten hours and fifty-three minutes, an average daily consumption of fuel of 100 tons, or total consumption of 745 tons. Her cargo is 3350 tons ; consumption of fuel per ton of cargo, 4·45 cwt. ; average speed, 15·6 knots ; consumption per knot, 5·3 cwt. ; indicated horse-power, 4920 ; consumption per horse-power, 1·9 cwt. In other words, we are now enabled to transport fifteen times as much freight across the ocean in one half the time at an expenditure of less than one and a half times as much coal as in 1840.—*The Engineer.*

In railway surveys and construction the government of Queensland contemplate an expenditure of £820,000 in 1878–79.

PROGRESS IN SCIENCE AND THE ARTS.

General Science.

ELECTRIC LIGHTING.—In the present excitable state of the public mind in reference to the possible uses of electricity as an illuminating agent, it is a matter of difficulty to preserve an attitude of impartiality as to the comparative merits of the numerous inventions in this field that are candidates for public favor. In defense of their vested interests, the holders of gas stocks, and others who are interested in coal-gas manufacture, make summary work of all evidences and claims that may be put forth on behalf of electricity as a practical rival to the former ; while, on the other hand, the claims of many inventors, here and abroad, for the electric light are so extravagant that they bring into discredit what is capable of proof, or cast doubt upon what has already been fully demonstrated by means of electricity.

An impartial survey of this much discussed topic will show, we believe, that gas and electricity each has its peculiar sphere of utility ; and, while the uses and advantages of the former are acknowledged, enough also is known from the present achievements of the electric light to convince the candid student that this also has its place and its utility, and that, in certain applications, its merits are so preëminent, that in them it has come to stay, and will very likely, slowly but surely, win for itself a wider position than the former, and one equally permanent.

While it was demonstrated twenty years ago, and many times since, by able electricians, that the electric light could be maintained and controlled in numerous small lights for a limited time, it has been as universal an experience that all methods known for this purpose were impracticable for any other than laboratory experiments, because of the unreliability and costliness of the results ; and this statement, we believe, will hold good even at the present time, in the absence of practical demonstration. With this limitation, therefore, there is no tangible evidence that the reputed inventions of Edison—notwithstanding the claims that he has made, or, perhaps more correctly, the claims that enthusiastic and overzealous admirers have made for him—have brought us any nearer to the solution of this perplexing problem than those of his predecessors of the last twenty years.

We have already taken occasion to express our doubts as to the possibility of a practical and economical production of the electric light by any method of incandescence, such as that which is alleged to be an essential feature of Edison's reputed invention ; but feel quite safe in expressing a belief in its many uses, in the form of the voltaic arc, as for some years successfully demonstrated in light-houses on the coasts of England and France, and more recently in various other situations, where it has demonstrated its merits, under various systems, here and abroad.

There is a wide field for a powerful, economical, and reliable illuminating agent, in many situations, and for many uses, where coal-gas and other illuminants fail to meet the requirements. Among these demands are such engineering works as tunneling and mining ; lumber mills and booms ; ice-cutting and loading ; the lighting of docks, wharves, and piers, light-houses, and submarine works ; the various branches of coast defense and torpedo service ; signal lights at sea and on locomotives ; large rooms in mills, factories, foundries, and workshops ; railroad stations and depots, car sheds and yards ; all classes of large mercantile and manufacturing establishments where to distinguish colors as well by night as by day is advantageous to the manufacturer or merchant and the purchaser, as in silk-mills, dye-works, clothing stores, etc. ; and for scientific and illustrative uses in projection, etc., where the purity and intensity of the electric light make it vastly superior to any other. For these and other uses the electric light, where it is made to realize the conditions we have named, is an acquisition of the greatest value ; and the question is an interesting one, whether any of the various methods now before the public fully meets the requirements of successful practice. We have given careful examination to most of the systems in use and favor in Europe, as shown by the machines of Gramme, Siemens, Lontin, Wilde, the Alliance, etc., and the lamps or regulators of Duboscq, Serrin, and its improvement by Lontin, Siemens-Halske, Regnier, Rapieff, Werdermann, and the Jablochkoff candle ; as also to the American machines of Wallace-Farmer, Weston, Arnoux, and Hockhousen and Brush ; with the lamps of Wallace-Farmer, Sawyer-Mann, Fuller, Brush, and other patterns. We have also before us testimony from the best authorities covering the whole range of the inventions for electric lighting for twenty-five years past by the battery and the dynamo machines. Many of these, once prominent, have fallen or are now falling into disrepute, notably the celebrated Jablochkoff candle, of late so largely used in Paris, but which appears to be rapidly becoming obsolete, on account of

the enormous expense of its maintenance. At the present time, the Gramme machine and the Serrin lamp (improved by Lontin) appear to have the lead in Europe; and the Brush machine and Brush lamp in this country. Quite four fifths of the machines in use abroad are of the Gramme construction, and more than that proportion of the machines in use in this country for electric lighting are of the Brush pattern, machine and lamp.

At a late meeting of the Society of Arts, of London, Mr. Preece, Electrician of the British P. O. Department, pronounced the dictum that brilliancy, steadiness, and durability were the necessary properties for an electric light, and that no one device in use in Europe had these united qualifications. Without overstepping the bounds of legitimate inferences based upon the records of performance at hand, we believe that in respect to the qualifications laid down by Mr. Preece, the American invention known as the Brush machine will not be found wanting; and that for the uses for which the machine and lamp are intended by the inventor, namely, for distributing a large amount of light from large focal centers over large areas, the Brush system will compare very favorably with the most effective systems in use anywhere, if it be not much the most effective. The following record of the more prominent places where it has been introduced speaks well of its merits. It is in use in some of the largest cotton, woolen, and iron mills of New England, of which it will be sufficient to name the Merrimack, the Willimantic Thread Co., Washburn & Moen iron mills, etc.: it is being placed in the New State Capitol building at Albany, N. Y.; it is in use in the Permanent Exhibition Building, and in the large store of Mr. Wanamaker, in Philadelphia, and in various other places in the State of Pennsylvania; it is now being placed in the National Capitol at Washington: in the Palace Hotel at San Francisco; it is in use in one or more of the mines of the Comstock, and in various other localities South and West.

Without entering into too much detail regarding its construction, we may notice that the generator is simple and easily managed, the lamp wholly automatic, the carbons of peculiar make, copper-covered and inexpensive.

While the drift of the experiments made here and abroad is in the direction of producing a number of small lights by incandescence or otherwise, the efforts of Mr. Brush appear to be in the other direction, namely, the multiplication of large lights on a single circuit, with the least possible expenditure of power. The Jablochkoff candle run in groups of four or six on a single circuit, is affirmed on good authority to be very exhaustive of power, to burn but an hour and a half, to be unsteady in its light, and to cost three times as much as the Brush light; while the large machines now being built by the Brush Company, we are informed and assured, use 13 to 15 H.P., feed on a single circuit 12 to 18 lights of 2000 candle-power each, costing less than four cents per hour for each light, and in respect to brilliancy, steadiness, and durability, meet all reasonable requirements.

Here, as in Europe, the question of the desirability of the electric light for many uses has been settled in its favor. The main question now is as to its cost. We run no risk in affirming that for the uses pointed out in what has preceded it will, in the near future, come to be considered indispensable; and that on the grounds of healthfulness, greater efficiency, and general economy, it will work its way steadily into place and permanence. It is scarcely necessary to remind our readers, in conclusion, that our favorable comments upon the Brush machine relate strictly to its record and performances for the purposes above enumerated; but it may, perhaps, be as well to add that the makers of this apparatus make no pretensions to lighting for domestic uses or to the detailed lighting of streets, but, on the contrary, explicitly declare their disbelief in the practicability of applying the electric light economically to these uses.

ELECTRO-CHEMICAL ACTION UNDER PRESSURE.—Bouvet, a French physicist, who has given much study to the subject of electro-chemical action under pressure, having conducted experiments at pressures as high as 100, 200, and 300 atmospheres, announces the conclusion that electro-chemical action is independent of pressure. The quantity of electricity necessary, for example, to decompose a given weight of water is the same, whatever may be the pressure.

TRANSMISSION OF POWER BY ELECTRICITY.—Regarding the feasibility of transmitting power to great distances by means of electricity, generated in dynamo-electric machines, driven by water-power, concerning which we briefly presented in our last issue the favorable views of Professors Houston and Thomson (apropos of the question of transmitting the wasted and almost incalculable power of Niagara Falls), it may be of interest to recall the fact that the opinion of these careful investigators is fully substantiated by the high authority of Dr. C. W. Siemens. In his presidential address before the last meeting of the British Iron and Steel Institute, Dr. Siemens, in briefly discussing the use of electricity as a substitute for steam, made substantially the following statements: He declared that so long as the source of electrical power depended upon the galvanic battery, it must, in the present state of things, remain far more expensive than steam-power; for the reason that zinc, which is the fuel of the galvanic battery, is vastly more expensive than coal, the fuel of the steam-engine. If, however, continues Dr. Siemens—and here he comes to the subject we have in hand—a natural force, such as water-power, could be utilized to generate electricity economically, the case would be very different. A dynamo-electrical machine moved by water-power would give a powerful electrical current which could be transmitted through a metallic conductor to a great distance, and thus be made to move magneto-electric engines, to ignite electric lamps, etc. "A copper rod of three inches in diameter," says Dr. Siemens, "would be capable of transmitting one thousand horse-power a distance of, say 30 miles, an amount sufficient to supply one quarter of a million candle-power, which would suffice to illuminate a town of moderate size." In so far, therefore, as Dr. Siemens expresses his conviction that the transmission of power by electricity over great distances is perfectly practicable, his views accord with those of Profs. Houston and Thomson, though the calculations of the latter indicate that the former's statements were far within the boundaries of safety in his general references on the subject.

From the foregoing it would appear that, under the circumstances predicated in the preceding discussion, the magnetic engine may not only compete favorably with the steam-engine, but may even be enormously superior to it. Where, however, these favorable conditions, that is, a great water-power, or other natural force that can be economically employed to generate powerful electrical currents, do not exist, any competition between steam and electricity is utterly out of the question. The considerations upon which this statement is based, being of a theoretical nature, are not suited for detailed presentation in this department; but, since the conclusions to which they point may be of interest, we give them in brief in what follows.

If the entire quantity of heat developed in the combustion of one pound of coal could be applied with perfect economy in heating a body of water, it would suffice to raise the temperature of 14,252 pounds of water one degree (Fahr.); while the heat developed by the burning of one pound of zinc (the fuel of the galvanic battery) would raise 2372 pounds of water one degree in temperature. Theoretically, therefore, coal has about six times the heating power of zinc. Other theoretical considerations, however, relating to certain chemical dissociations taking place in the battery, reduce the thermal effectiveness of zinc more than one half; so that, on the above supposition that both are burned with perfect economy, coal will be 14 times as effective as zinc, pound for pound. The theoretical mechanical value of one pound of coal would be expressed by 5½ horse-power per hour; and that of zinc in the theoretically perfect battery, by about ½ horse-power. In practice, zinc will make a much better showing; for the best steam-engine only permits us to realize about $\frac{1}{15}$th of the theoretical value of the coal; while the best form of battery will realize not far from ½ of its theoretical duty; from which it is easy to calculate that in the best actual practice coal only gives a mechanical effect about one third greater than zinc, pound per pound. But when the important element of *cost* is brought into the calculation, this seemingly close rivalry disappears quite out of sight; for, since the price of zinc is about 20 times that of coal, pound for pound, the odds against zinc in practical competition with coal in the generation of power will be about as 30 to 1. With the enormous margin that our engineers have for improving the steam-engine, it seems hardly probable that these odds will ever be overcome.

THE INVENTOR OF THE CARBON TELEPHONE.—It will be remembered by our readers that the controversy respecting the microphone and the carbon telephone brought to light the fact that Clerac, of the French Telegraphic Administration, had announced, as far back as 1866, the principle that underlies both—that carbon powder possessed the property of varying its resistance under pressure, and also the fact that he applied his discovery in the construction of variable-resistance rheostats, constructed of tubes filled with powdered wood-charcoal, coke, or graphite, which was compressed more or less by screws at the ends of the tubes, so as to alter its electric resistance. These facts have been generally admitted to invalidate Edison's claim to priority as to the discovery of the principle, though it by no means affects the genuineness of his rediscovery, and the ingenuity of his application of it in his carbon telephone. Now, however, as we learn from the *Journal Télégraphique*, Clerac's claims to be the original discoverer of this interesting principle are challenged by Dr. Zetzsche, who claims that carbon resistances were used in Germany prior to 1866. The *Telegraphic Journal*, in recording this assertion, observes, however, that Zetzsche's remarks appear to apply to solid carbon resistances, and not to variable ones of carbon-dust.

REPORTS ON THE PARIS EXPOSITION.—The Assistant Commissioners of the United States to the Paris Exposition are, by public rumor, credited with being industriously engaged in the preparation of their reports upon the different departments assigned to them. The same rumor affirms that these reports will be "very thorough and complete, and, when published, will not only be of interest to the country, but of advantage to its trade and industries." This rumor, like many others, is "highly interesting if true." If previous cases afford any criterion to go by, it will be about two or three years before these reports will see the light. It was so in the case of the Paris and the Vienna reports, in both of which cases the cost of their publication might just as well have been spared to the government for all the benefit the industrial interests of the country derived from them; for the special trade and technical journals have long since given to enterprising manufacturers and others all the information of value relating to their special trades and manufactures which the Exposition had to demonstrate; and to the public at large the direct value of reports of this class, to express the idea concisely, is inversely proportional to the time absorbed in getting them into print and circulation.

THE SCIENTIFIC EXPEDITION AROUND THE WORLD.—If newspaper reports, which for the past year or two have discussed the prospects and intentions of its originators, are to be relied upon, the Woodruff Scientific Expedition around the world will positively set out from the port of New York on the 8th of May next; all hinderances, especially those arising from the selection of a steamer adapted to the requirements of the expedition, and which have combined to defer the day of departure, having at length been overcome. The nature of this expedition, the countries to be visited, etc., have already been told in the JOURNAL, and the repetition is therefore unnecessary. The vessel selected is stated to be the General Werder, purchased from the North German Lloyds, a steamer of 3020 tons burden, and which, under a special act of Congress, has been granted an American register. The professors selected for the expedition number ten, representing the leading departments of the natural sciences; the student passengers are said to number 250; and the duration of the cruise to be sixteen months.

Mining and Metallurgy.

The Genesis of Cinnabar Deposits was the title of a paper lately read before the San Francisco Academy of Sciences, by Mr. S. B. Christy, the drift of which was to settle the question as to whether cinnabar deposits were formed by depositions from solution or by sublimation. From the brief report of the paper which appeared in our contemporary, the *Mining and Scientific Press*, we learn that after describing the peculiarities of the most noted cinnabar mines in this and other countries, the author proceeded to show, from what we know of the chemical properties of the substance, that the present state of our knowledge was insufficient to explain the formation of cinnabar in the wet way.

The author next presented the results of some original and very inter-

esting experiments he had undertaken upon the action of certain solvents on cinnabar, at high temperatures and pressures, the result of which he states to be that cinnabar is soluble in alkaline sulphides, at temperatures between 150° and 250° C., and at pressures of from 200 to 500 pounds per square inch. Under these circumstances, the author has succeeded in producing artificial cinnabar similar in all essential respects to that which occurs in nature.

In discussing, finally, the relative probabilities of the rival theories above named, the author maintained that the preponderance of the evidence was in favor of the view that the deposits of cinnabar, as they exist at present *in situ*, are undoubtedly the results of deposition from alkaline solutions, under conditions not unlike those which he has succeeded in reproducing.

A modification in the mode of precipitating copper by iron, in the wet process of copper metallurgy, is proposed by Mr. Ospina, of the University of California. The modification is proposed where the precipitating iron is used in the form of filings or iron-sponge. The object of the new procedure is for the purpose of avoiding the mixing of the fine iron with the resulting copper, and is based upon the principle that the precipitation is effected in the electrolitic way—a fact which Mr. O. has succeeded in demonstrating by several striking experiments. The process consists, in brief, in packing the iron into bags before putting it into the copper solution. By this device he succeeds in getting the copper precipitated on the bag, and only a small percentage (2½ to 3 per cent) inside. The precipitation is said to be best effected at a high temperature, and from a solution not exceeding 12° B., in order to obtain a loose deposit of metal that can be readily detached from the bag. The time occupied in effecting the precipitation in this way is longer than where uncovered iron is used; but there is claimed for it the advantage of saving, at the cost of a little more time and fuel, the expense and trouble of refining the copper, which must be done when it is mixed with a large amount of iron.

THE GROWTH OF BLAST-FURNACES.—Nine of the twelve iron furnaces in and about Pittsburg are now in blast, and in referring to the superiority of their construction and management, as contrasted with old times, it is noted that they are now producing 5000 gross tons of pig per week, an average of 556 tons each, which, if kept up during the entire year, would give 260,000 tons, or nearly one eighth (⅛) of the total production of all the furnaces of the United States, as per the figures of last year's production. The average rate of production of these furnaces, according to our authority, is about 3½ times as great as the average rate of production of all the furnaces in blast in this country in 1878, and were all the blast-furnaces of the United States of the same capacity as those of Pittsburg, it would require but 74 furnaces to produce all the iron made in 1878.

In a late address before the London Society of Arts, a distinguished speaker called special attention to the enormous development of steel manufacture during the past two or three decades. He believed, from the rapidity with which it was taking the place of iron, that the days of the latter are numbered, and that in fifty years hence it (iron) would be unknown.

IRON NICKEL ALLOYS.—By experimenting with mixtures of iron and nickel chlorides, Mesinier has succeeded, by reduction at a red heat by hydrogen gas, in producing well-defined alloys of iron and nickel, some of them having a distinct crystalline structure and very analogous to the meteoritic alloys.

THE "METALLURGICAL QUERIES," given in the JOURNAL of December 7th, 1872, and which our readers will remember asked for an explanation of the behavior of gold amalgam, and of the cupellation process, have brought us a reply from H. L., a prominent chemist of Philadelphia, whose statements we herewith briefly condense. He expresses the opinion that the facts noticed by our correspondent, with regard to amalgams, may be explained upon the presumption that the fluid amalgams are solutions of the true amalgams in excess of mercury, and that the solution is maintained by such feeble affinity that any conditions that present a resistance to the passage of any portion of the solution will be sufficient to break up the union. Similar facts, he observes, may be noticed with aqueous solutions, in which, by the use of certain membranes, the substances in solution may be retained on one side of the membrane, while the solvent will pass through. He regards the concentration of an amalgam by means of chamois leather as a process analogcus to dialysis. He observes, also, that gases show a similar behavior. Regarding the second query, respecting cupellation, our correspondent holds that the different action of the lead oxide and silver upon the cupel has a chemical explanation. The lead oxide enters into a sort of chemical union with the bone-ash, which latter is, as it were, "wet" by the melted lead oxide, and a compound formed, analogous to lead phosphate, besides possibly irregular compounds, in which the lead oxide acts as an acid toward the calcium. No such chemical relations can exist, concludes H. L., between metallic silver and bone-ash, hence no absorption can take place.

SIEMENS'S GAS-FURNACES.—On the authority of Messrs. Richmond & Potts, the American agents for Siemens's Regenerative Gas-Furnace, we are able to state that the total number of Siemens furnaces in the United States at the close of the year 1878, exclusive of a few used in melting glass and in zinc and chemical works, was 168, divided as follows:

Heating and puddling	101
Open-hearth steel melting	27
Crucible steel melting	40

During the year there were built or in course of building 15 heating and puddling furnaces, and 6 each of open-hearth and crucible steel melting furnaces. The capacity of the open-hearth furnaces mentioned above is, per annum, 140,000 gross tons. The 40 crucible furnaces have a capacity of 948 crucibles per heat, representing an annual productive capacity of 40,000 gross tons.

Chemistry and Technology.

ZINC-DUST AS A CAUSE OF FIRES.—A recent issue of the *Insurance Record* calls attention to the dangerous character of zinc-dust, which appears to be imported into this country in considerable quantities for use in certain branches of industry.

The material presents the appearance of a gray powder, in an extremely fine state of division, and its use appears to be in the manufacture of paints. Chemically, it contains as much as 40 per cent of metallic zinc-dust, the remainder being oxide and carbonate. Another variety of the same commodity, known commercially as slate-colored zinc oxide, contains really very little or no oxide at all, being almost wholly a metallic dust, which, in the process of manufacturing zinc-white, has escaped combustion, and is deposited in the flues of the condensing apparatus. These products, the *Insurance Record* points out, are extremely apt to originate mysterious fires, if precautions are not taken to keep them from contact with moisture; for, owing to its very fine state of division, this metallic dust, in the presence of water moisture, will eagerly oxidize, and as this oxidation will be attended with a very considerable rise in temperature, the hydrogen gas evolved in the process may be inflamed, and, directly or indirectly, inflammable materials in the neighborhood may be ignited, and in this way the building or ship in which it happens to be stored may be destroyed, while the cause of the disaster may never be suspected. The *Record* points its moral by citing the case of the fire in the steamship Lord Clyde, in the year 1876, and which at the time attracted some attention. The facts in this case were about as follows: A number of casks of zinc-dust were placed in the hold of the vessel, without any notice of the dangerous character of the material having been given to the owners of the ship. The casks, or some of them, by some means got wet, and within twelve hours after they had been put on board, the vessel was found to be on fire. When the source of the fire was discovered, the contents of one of the casks were found to be red-hot. As another contribution to the causation of what, for want of a better term, are called "spontaneous" fires, the facts above detailed are worthy of special attention.

IMMENSE PHOTOGRAPHS.—At a recent meeting of the Berlin Association for the Promotion of Photography there were exhibited some remarkable photographic pictures taken by Herr Holtermann, of Sydney, Australia, and which, in point of size, probably far exceed any thing thus far accomplished in the art. They were mounted on an endless band of paper, strengthened by linen, and were nearly 100 feet in length. Among them were two colossal panoramas of the cities of Sydney and Melbourne, each made up of about a dozen sheets (18 × 20″ each), and very skillfully joined together, the separate pieces harmonizing perfectly in tone and depth. One picture of the list, and which had obviously been printed from a single negative, was 150 by 93 centimeters in size (about 5 × 3 ft).

The so-called magic mirrors, with which the Japanese metal-workers have hitherto succeeded in puzzling our *savants*, have been generally supposed to owe their strange property of reflecting images that were quite invisible upon their brilliantly polished surfaces, to corresponding inequalities in the density of the surface, produced by some means during cooling or by stamping. Professors Ayrton and Petty, who have lately studied their peculiarities, offer another explanation. They affirm that the effects above noticed are produced by reason of very slight irregularities in the curvature of the polished surfaces, these irregularities being such that the thicker parts, corresponding with the raised patterns on the back, are flatter than the remaining convex surface, by which difference there would be less dispersion of light from the thick than from the thin portions of the surface. As, unless we are greatly mistaken, we remember to have seen such mirrors with apparently perfectly plane surfaces, the above explanation would appear to be less satisfactory than the older one.

A new product of manufacture is credited as the invention of Mr. S. H. Hamilton, of Bushnell, Ill., being the production of successful imitations of hard-wood lumber out of common wheat straw, with all the effects of polish and finish possessed by the originals.

CHEMICAL ITEMS.—Prof. Feser, contrary to the generally accepted verdict, announces, as the result of a long series of experiments, that salicylic acid has no value either as a prophylactic or in the treatment of infectious diseases, carbuncles, etc.——Prof. Knapp proposes, in *Biedermann's Centralblatt*, the substitution of a basic ferric sulphate for oak bark or other tanniferous material in the tanning of leather. By the use of this substance he declares that it will be ready for use in from two to four days.——Dr. Kayser reports, as a result of his examinations of numerous pigments sold in Germany, such as white lead, zinc-white, chrome yellow, etc., that in addition to the heavy-spar they contain, and which is stated by the seller and allowed for in the price, they contained also a notable percentage of gypsum.——Mr. Otis Johnson lately described an improved test for arsenic with the Marsh apparatus, whereby this substance could not be mistaken for antimony, and by which, when both these substances were present, only arsenic will be given off in the form of arseniureted hydrogen. It consists in allowing potassic hydrate to act on aluminium in the presence of the suspected substance in the ordinary Marsh apparatus.

Mechanics and Engineering.

The construction of a harbor of refuge on the Pacific Coast, somewhere between San Francisco and the Strait of Fuca, is now being strongly urged before Congress. The points named are about 700 miles apart, and yet between them it is said there is not a single harbor where ships may enter for refuge. Three points are named at which this improvement could be conveniently located, namely, Point Orford, about half-way between the Strait of Fuca and San Francisco; Foulweather Cape, about 120 miles to the north, and Cape Coos, between the two. The Government Engineer, Major Wilson, has made an examination of the locations proposed, and is understood to have reported upon the feasibility of a breakwater at Point Orford, which would give to vessels ample protection. Congress has also been strongly urged to appropriate a considerable sum for the resurvey and improvement of the Delaware and Schuylkill rivers and harbor, which, from the representations made of the growing requirements of commerce, would appear to be urgently needed.

Referring to the projected Delaware & Chesapeake Canal, the Baltimore *Sun* says: "The lower routes seem more practicable, and probably the route commencing at the mouth of the Choptank is the most practicable of all. It is some distance down the bay, but comes out at Lewes, the most desirable point for the Delaware terminus." On the Chesapeake

side, the same journal holds that this route presents equally desirable advantages.

A series of calculation cards designed to facilitate the calculation of areas, and which will be found to be specially serviceable to the engineer in the calculation of excavation and embankment work, was presented by Mr. W. B. Ross for the inspection of members, at the last meeting of the Engineers' Club of Philadelphia. By the use of these cards, it was shown that quantities could be ascertained in less than one third of the time usually required.

THE RAILROAD SCHEMES at present under way in Italy are of considerable magnitude. The *Engineering News* is our authority for the statement that the government of this kingdom has approved plans for the construction of about 2500 miles of new road, mainly in Northern Italy, which undertaking will demand a capital of about 130,000,000 fcs. for construction, and probably 20,000,000 fcs. more for equipment. The plans decided upon are said to contemplate the consolidation and extension of the lines now running east and west from Trieste to Mont Cenis, and likewise of the lines running the length of the peninsula.

A NEW MITRAILLEUSE.—We learn from the *English Mechanic* that some remarkable results were lately obtained in experimenting at Witten (Westphalia), with a new form of mitrailleuse, made for the Russian government, after the design of Palemkranz, a Swedish engineer. These new weapons are said to have excited surprise, both because of the effect of their projectiles and the rapidity of their fire. The gun designed for naval use has four juxtaposed barrels, while the field arm, a smaller model, is supplied with ten. According to the expertness of the gunner, 160 to 300 balls per minute can be delivered from the first-named piece, and from 800 to 1400 from the latter; and the balls not only traverse three armor-plates, each ⅜ of an inch in thickness, and connected by rivets, but penetrate to the depth of one inch into an iron plate placed behind them. The best specimens of this gun are reported to be in possession of the Swedish navy; but the Russian government is having a large number manufactured. The field instrument is very light, and can readily be moved about by men when horses are not at hand, while the heavier naval piece is specially designed for service against torpedo boats.

THE ISTHMUS SHIP-CANAL.—In a recent lecture delivered before the American Geographical Society "On the Proposed Interoceanic Ship-Canal across the American Isthmus," Rear Admiral Ammen reaffirmed his conviction, after an examination of the reports of the recent expeditions of Lieut. Wyse, of the French navy, "that no possible route exists comparable with what had been presented in the surveys made by order of our government." In this indorsement the admiral must be understood to refer especially to the Nicaraguan route, which was recommended, some years ago, as the most feasible and best adapted for the canal, by a special government commission, appointed to examine all the data gathered by the numerous expeditions sent out by the government, and to select the best. The route and plan of Commodore Lull and Civil Engineer Menocoal, U.S.N., on the Nicaragua line, were recommended as the best by this commission, as above stated. Admiral Ammen thinks $100,000,000 would be sufficient for the work.

The value of dry plumbago as a substitute for oils and tallow for steam cylinders, and upon the use of which we have already published a very favorable account in the JOURNAL, is very emphatically indorsed by a mechanical expert in our contemporary, the *American Machinist*. The engine on which the report is made was an 11 × 30 horizontal engine, piston speed 300 feet per minute, and is known as the "West Poppet-Valve, Automatic Engine." It was worked up to its full capacity, and, to insure a fair trial, the old oil-cup was exchanged for a goblet-shaped tallow-cup with a lid, after which the piston-follower and springs were taken out and cleaned. A third of an ounce of finely-powdered Ceylon plumbago, moistened with a little water, is placed in the cup twice a day, and, after eighteen months' constant use, has been found to answer perfectly.

The yearly production of potash in France is estimated at 14,000 tons, 10,000 of which are obtained from beet-ashes and 1000 tons from the suint of wool.

A successful competitor at the late Paris Exhibition offers his bronze medal as a contribution to the lottery, as it was awarded him without any examination of the quality of his exhibits.

Melted gallium dissolves aluminium even below 15°, forming liquid or semi-liquid amalgams which oxidize very slightly on exposure to the air, but decompose water powerfully, the gallium being liberated in the form of metallic globules.

The dangerous character of lead compounds is shown by the fact that in the years from 1838 to 1847 no fewer than 3142 patients suffering from lead-colic were admitted into the hospitals of Paris, although there were at that time only two white and red-lead works in the city. Of these cases 112 proved fatal.

INCRUSTATION OF LEAD PIPES WITH SULPHIDE OF LEAD.—A hot concentrated solution of sulphide of sodium is allowed to flow through the pipes for ten to fifteen minutes. They then appear as if coated within with a gray glaze, and water afterward passed through them remains free from lead.

At the University of Cambridge, England, mechanical workshops have been fitted up with machinery for construction of instruments and apparatus to be employed in philosophical research. Good workmen have been employed as teachers. Several university men, who intend becoming engineers, have become members of the classes now formed for regular instruction in the use of tools and machine construction.

THE BLACK HILLS COAL MINES.—The coal mines in the Black Hills are almost as big bonanzas as the gold mines. Coal sells at the mine at $3 per ton as fast as it is taken out, and and the hauler receives $25 and $30 per ton at the camps. As it takes five days to make a trip, and two tons are hauled at a load, the teamster averages $55 per trip, which is good wages.—*Cheyenne Sun.*

REVOLUTION IN TANNING.—Prof. Knapp proposes the use of a basic ferric sulphate instead of oak-bark or other tanniferous material. He adds to a boiling solution of copperas the quantity of nitric acid requisite for the peroxidation of the iron, and after the reaction is over adds more copperas. The hides are suspended in the cold solution at a suitable degree of concentration, and are ready in from two to four days.

CERTAIN SUBSTITUTES FOR QUININE.—O. Hesse.—The Australian tree *Alstonia constricta* was formerly supposed to contain quinine; recent observation has instead merely detected alstonine, a bitter principle not possessing basic properties. Ditain, a principle obtained from the bark of *A. scholaris* is also no alkaloid. Crossopteryx bark has been stated to contain quinine, but in the author's opinion it is little better than bad fire-wood.

MINING MACHINERY WANTED IN CHINA.—The just-published English Consular Report from Canton, China, also states that General Fang, a well-known military officer, has been instructed to arrange for an immediate supply of European machinery to be used in local mines. It appears to be thought that there is great likelihood of the early working of coal and other mines in the provinces of Chee-lee, Kiang-see, Kiang-soo, and Se-chuen.

ROYAL INSTITUTION OF GREAT BRITAIN.—The managers have decided that the next Actonian Prize shall be awarded in 1879 to an essay illustrative of the wisdom and beneficence of the Almighty; the subject being, "The Structure and Functions of the Retina in all Classes of Animals, viewed in relation with the Theory of Evolution." The prize is one hundred guineas, and will be awarded or withheld as the managers shall think proper. Competitors for the prize are requested to send their essays (with or without their names being affixed) to the Royal Institution, addressed to the Secretary, on or before October 1st, 1879. The adjudication will be made by the managers in 1879.

THE SUTRO TUNNEL CONTEST SAID TO BE ENDED.—SAN FRANCISCO, February 4.—The contest between Sutro and the mining companies is at last virtually settled. An understanding was reached last evening on all general points, though some details of the agreement yet remain unsettled. Both sides say, however, that a compromise may be considered effected. The terms have not been made known officially, though it is reported on good authority that a royalty of $2 a ton on all ore hoisted worth $50 or more a ton will be paid to the Tunnel Company, and a less amount on ore of inferior grade. The result has had a strengthening effect on most of the north-end stocks to-day. So many reports of this kind have been made and contradicted of late, that we think further information is needed before this be accepted.

OCEAN CURRENTS.—Professor Zöppritz, of Giessen, has investigated mathematically the question whether ocean currents are produced by the winds. One of the main objections urged against the theory that ocean currents are due to the impulse of the winds is that the winds can, it is alleged, produce only a surface drift, whereas many of the currents extend to great depths. Mr. James Croll, a high authority on this and kindred subjects, has always maintained that this objection is erroneous; that if the surface of the ocean be impelled forward with a constant velocity by the wind or by any other cause whatever, the layer immediately below will be dragged along with a constant velocity somewhat less. The layer underneath this second layer will in turn be also dragged along with a velocity less than the one above it. The same will take place in regard to each successive layer, the velocity of each being somewhat less than the one immediately above it, and greater than the one below it. In this manner the surface velocity may be transmitted downward to any depth. This conclusion has now been demonstrated by Professor Zöppritz to be correct. The surface velocity is propagated downward, however, with extreme slowness. Thus it is found that for a mean depth of 4000 meters it would require 100,000 years for the trade-winds to produce the existing equatorial currents.

THE HELIOTROPE IN GEODETIC SURVEYS.—Professor L. M. Haupt describes in the *Journal of the Franklin Institute* the use of the heliotrope in reflecting the sun's rays to distant points, and thus facilitating the reading of angles, either horizontal or vertical, on lines of from 15 to 100 miles long. Its construction is so simple that it may be made by any school-boy with a penknife. Two opaque screens are placed about eighteen inches apart upon a strip of wood forming a base, and screwed or nailed fast. A hole about one inch in diameter should be cut through each screen, the one in rear being a little larger than the other, and across each there should be drawn two fine wires or threads, so as to intersect each other. About six inches in rear of the screens there should be placed a small mirror—three inches in diameter would be sufficient—so mounted as to have the two motions horizontal (or in azimuth) and vertical (or in altitude). The crude instrument is then ready for operation. To throw the ray upon any given object visible to the unaided eye, turn the mirror down out of the way or remove it altogether, and sight across the wires, moving the base until the line joining the intersections of the cross wires passes through the object. Then replace the mirror carefully so as not to disturb the line of sight, and turn it in either or both directions until the shadow of the edge of the hole in the first screen is concentric with that in the second. The reflected ray will then be visible to an observer at the given point. Although so simple and inexpensive, this little instrument serves to increase greatly the economy and accuracy of reading angles to very distant objects. The rays reflected from it are plainly visible to the naked eye at from thirty to fifty miles, and with telescopes these "day stars" have been seen at a distance of nearly one hundred miles across Lake Superior when no trace of land was visible. By adopting any convenient code of long and short flashes, made by obscuring the ray, messages may be sent from point to point. The Morse code is as convenient as any other, but for simplicity a conventional code expressing certain sentences by a few flashes is found to answer the ordinary requirements of field work.

THE MANUFACTURE OF IRON IN CENTRAL AFRICA.

Dr. Arthur Mitchell, in delivering the Rhind lectures on Archæology in Edinburgh, chose as his subject for one "The Iron Age Savage." He described the negro tribes of the heart of Africa as having reached an iron age without having passed through an age of stone, and there was just as little evidence of their having passed through a bronze age, though

copper was one of the few metals which were worked by them. It would be quite a mistake to conclude, from the fact that the Central African tribes were acquainted with the use of iron, that they were on that account of stronger capacity or of higher culture than those tribes which had no iron, or even had no metal, and who were in the fullest sense in the stone age. The Central Africans generally found their iron ore on the surface, and extensive mining operations were not necessary. The lecturer described the smelting processes pursued by the negroes, and the implements used, the result of the operations noticed being, he said, a metal quite equal to the best forged iron of this country. He noted that the anvils and heavy hammers used in the iron production were stone, and not iron; but therein the negroes showed common sense; for it would be impossible for them to carry about with them heavy anvils and sledge-hammers of iron, while stone ones equally useful for the purpose in view could be had anywhere. The chisels and light hammers were, however, of iron, and the praise which had been bestowed on the work of the negro smith, on his swords, daggers, spear-heads, and arrow-heads, was exceedingly high. Their chains showed a refinement of form and a neatness of finish which vied with the best English steel chains. They worked in copper with equal skill. Some tribes devoted themselves entirely to all the branches of manufacture, while others devoted themselves to special objects. These people were also acquainted with the art of making pottery, and it was practiced everywhere with great skill. They were also expert carvers in wood. Some of the tribes had iron graving tools, and they used a rough leaf, which did its work well, as sand-paper. On the whole, the wood-work showed a richer taste in form than the pottery, but it was in the same style.—*Ironmonger.*

THE SALT TRADE OF GREAT BRITAIN.

The salt trade of Great Britain is a subject of much importance to a large number of our readers; for a reference to the following table shows that we receive from England nearly a quarter of a million tons of salt a year, at a cost to us of probably a million dollars annually.

The important discoveries of late years which have shown immense deposits of the finest rock-salt in various parts of this country, and lately the discovery of deposits in Central New York, make it probable that the important industries which depend upon the cheap production of salt will soon find a home here, and will add enormously to the wealth of the country. The great and growing use of salt in the manufacture of soda, bleaching-powders, and in various other chemical industries, as well as in the glass and pottery trades, and in metallurgical processes, makes it certain that there will, before long, be an enormous development of our salt interests, and of the industries that depend on them. It will not be many years before we shall not only produce all we require for our domestic wants, but we shall be able to export, if not the crude salt, at least the higher products of salt. In this connection, the amount and destination of English salt exports are of interest, and those who are interested can ascertain the amount and destination of the chemical products made from salt.

We are indebted to Mr. H. E. FALK, one of the largest English producers, for the following interesting review of the English salt trade for 1878.

One of the most interesting points in connection with this trade is the fact that it has for several years been "regulated" by a combination which Mr. FALK considers has been of great benefit to the trade.

TOTAL SALT PRODUCTION OF GREAT BRITAIN FOR 6 YEARS.

	Rock Salt.	White Salt.	Total.		Rock Salt.	White Salt.	Total.
1872.....	.....	....	1,309.497	1875.....	191,119	2,125,525	2,316,644
1873.....	.....	....	1,785.000	1876.....	154,531	2,118,725	2,273,256
1874.....	177,348	2,129,219	2,306,567	1877.....	178,525	2,556,476	2,735,001

For the fourth time now in succession I have to write, in this my annual review, of the stagnation of trade under which the whole commercial world is groaning. Happily for the salt trade, the universal evil has not been felt so severely by them, owing, to a great extent, to a judiciously administered organization, which succeeded in keeping production equal to the demand. Thus the market was never grievously overburdened, and the moderate scale of prices which had been fixed was, with (never in such cases failing) periodical exceptions, generally maintained.

Hence I have to report no official fluctuations of prices. They were based on 7s. per ton at the works for common. In times of very slack demand the discounts generally ranged 1s. per ton; occasionally more, but mostly less.

The export list proves that the demand has been throughout the year a fairly normal one all the world over, and since stocks in most of the leading markets have been very materially reduced, the salt trade may look with the new year into fair prospects. The Association of Makers holds its ground firmly, and it is not likely that, with the successful prestige it has gathered, it will be lightly abandoned, and so hand the whole interest of the district and its prosperity to the tender mercies of a ruinous competition which serves nobody.

The equalization of the Indian salt duties had a marked effect upon this great market for our produce, and, although it is not complete yet (as Bengal has still to be leveled downward about ten rupees per ton, before the whole scheme of the government is carried out), we have seen already symptoms of a much extended demand. Calcutta stocks are now very low. The general shrinkage of trade in India has not affected the salt deliveries. We are not having at present our accustomed supply of high-class Indian tonnage, because they are held fast in the Hooghly, owing to the unprecedented diminution of exports, and its sequence of low freights. This state of things, however, can not last forever, and will no doubt remedy itself soon, infusing fresh vigor into the salt export trade hence.

American exports present their normal figure. Prices in the leading markets have been low during the year, but the outward freights have been entirely nominal, and therefore enabled dealers generally to hold their own. The fine factory-filled salt bears an increasingly larger proportion of the exports to all northern ports, and the distinction of the different brands is wearing away fast, since all are now packed with great care, and it is well known that there is absolutely no difference in the intrinsic value of the salt of all.

The Baltic demand has again shrunk further, chiefly owing to the desperate depression of trade there prevailing. A revival of trade, and a better demand in this country for timber and other Baltic staples, will no doubt bring us again a better export figure.

The chemical trade has been suffering most severely from want of demand during the whole year, and the consumption of salt has therefore fallen off most sensibly. Accurate statistics are not easily obtained; but, if we compute various statements, the aggregate of diminished consumption of salt, I fear, will exceed considerably 100,000 tons during the past year.

Present prices for contract delivery in all 1879 are, shipped, f. o. b., Liverpool, per ton of 20 cwt.:

(Small Craft, loading at Weston Dock, will have a rebate of 1s. per ton from Liverpool quotations).

Common white	10s.	Ground rock:	
Butter	11s. 6d.	First quality	8s.
Calcutta half-and-half	12s. 6d.	Second quality	7s.
Shute stoved	12s. 9d.	Soiled agricultural	6s. 6d.
Factory filled (including sacks)	25s.	Sacks (these prices include cartage and labor of filling common salt):	
Handed squares	16s.	Common	5½d. to 6½d.
Fishery, second	12s.	Registered striped	6d. to 9d.
Extra coarse	13s.	Corn sacks	6d. to 10½d.
Picked lump rock	9s. 6d.		
Prussian rock	6s.		

Salt Freights have, as usual, fluctuated much during the year. I have accurately noted them in my monthly circulars. At present I quote:

Baltic.—Rates throughout nominal.

American Ports.—To the northern coasts, for steam and sail, from 1s. to 4s.; New Orleans, 7s. 6d.; Galveston, 10s.

Calcutta quite nominal, as home-freight prospects are so gloomy that owners prefer laying up here; 21s. to 22s. would probably be given, if tonnage were offering.

H. E. FALK.

BRITISH SALT EXPORTS FROM THE PORTS OF THE MERSEY.

	1871. Tons.	1872. Tons.	1873. Tons.	1874. Tons.	1875. Tons.	1876. Tons.	1877. Tons.	1878. Tons.
To the United States:								
New Orleans and Mobile	40,063	34,541	53,908	28,225	51,501	34,997	33,758	33,986
Galveston	4,152	5,983	11,512	9,867	7,178	14,383	5,656	7,668
Savannah	11,856	6,288	10,434	6,544	8,642	4,911	10,511	6,058
Charleston	4,158	3,014	6,078	2,989	4,872	4,206	2,517	3,770
Baltimore	22,697	14,812	27,112	24,945	25,941	24,698	22,238	20,055
Philadelphia	26,258	20,196	30,304	32,462	27,074	32,232	26,609	24,500
New York	36,743	41,144	46,470	41,194	48,915	66,359	60,288	50,710
Boston	11,836	8,168	9,855	7,742	9,002	11,843	24,223	35,055
Other Ports	25,176	19,060	26,939	22,917	29,407	21,471	37,546	34,556
Total	182,939	153,266	222,612	176,885	212,532	215,100	223,346	216,258
British North America:								
St. John, N. B.	7,960	9,330	5,256	4,625	8,007	8,346	11,774	9,508
Halifax	22,513	15,986	11,005	7,905	6,517	3,572	9,708	14,764
Quebec and Montreal	30,505	17,388	33,267	31,728	26,057	31,442	30,603	35,301
Newfoundland	12,158	11,522	1,426	1,260	2,359	2,178	2,494	2,978
Other Ports	21,156	13,408	8,915	10,506	11,867	12,565	11,339	9,073
Total	94,382	67,634	59,869	56,024	54,807	58,103	65,918	71,624
West Indies and South America	9,130	6,704	5,616	6,343	4,442	5,815	6,522	5,860
Africa	22,685	19,438	21,784	26,747	25,507	23,132	24,580	24,513
East Indies:								
Calcutta	253,801	207,433	180,265	216,629	286,696	205,526	192,161	189,192
Chittagong	6,960	6,653	6,851	9,793	6,347	4,482	1,345	3,062
Rangoon, etc	10,358	19,023	12,344	29,633	18,064	22,161	22,361	20,646
Australia:								
Melbourne	5,599	5,928	6,487	5,599	9,894	5,613	5,510	8,163
Sydney	2,957	2,695	7,988	5,206	12,323	6,727	12,178	6,311
Adelaide	636	1,096	525	168	573	394	1,190	765
Queensland, New Zealand	.....	73	1,808	1,426	2,128	1,174	1,686	361
Prussia:								
Memel	15,976	15,487	3,628	4,955	2,704	6,741	7,386	4,352
Pillau and Koenigsberg	3,919	2,403	6,922	4,116	3,922	13,037	6,883	6,731
Dantzic	18,660	15,397	24,443	17,212	25,555	23,354	14,535	11,955
Other Ports	.....	1,023	723	2,111	293	486	.....	441
Total	38,495	34,310	35,716	28,394	32,474	43,618	28,804	23,479
Russia:								
Wyburg	7,004	5,901	11,055	11,824	4,420	7,831	14,653	6,613
St. Petersburg and Cronstadt	8,327	13,045	22,798	26,272	15,825	24,997	13,603	12,730
Narva	3,439	7,962	7,782	7,947	5,425	9,134	3,127	5,836
Reval	.....	421	.....	321	1,522	909	1,370	1,902
Pernau	2,597	3,929	3,384	2,417	1,753	5,201	2,582	827
Riga	16,816	13,279	20,915	7,129	12,324	15,389	8,979	9,894
Other Ports	2,408	6,225	4,562	5,892	7,827	10,432	5,677	5,430
Total	40,591	50,762	70,496	61,802	49,200	73,893	49,991	43,232
Other Baltic and North Sea Ports	19,597	17,843	16,490	21,609	20,315	19,909	21,081	24,219
France and Mediterranean	1,898	1,130	1,706	2,243	889	1,055	1,680	1,053
Coastwise:								
Newcastle	16,336	24,171	15,447	12,146	30,471	39,738	21,576	19,568
Rest of England	8,144	4,398	2,853	4,740	7,554	3,350	6,226	4,486
Scotland	59,043	34,431	30,742	32,127	30,168	18,732	16,405	17,895
Ireland	8,197	8,608	5,572	2,520	4,075	4,735	3,323	2,655
Holland	18,339	19,384	19,653	27,400	23,652	22,102	20,107	19,204
Belgium	42,205	31,870	36,771	33,233	39,265	33,654	34,929	33,290
Export from Liverpool	842,292	716,790	761,995	760,577	871,376	808,968	760,919	735,836
Export from Runcorn and Weston Dock	213,435	166,583	148,956	177,958	161,111	173,614	182,638	233,668
Total from the Mersey	1,055,727	883,373	910,951	938,535	1,032,487	982,582	943,557	969,504

GENERAL MINING NEWS.

COLORADO.

MINING SUITS DECIDED.

DENVER, Colo., February 5.—In the United States Circuit Court to-day, in the great mining case of the Colorado Central Lode against the Equator, of Georgetown, the plaintiff paid costs, and under the statute judgment for the defendant was vacated and a new trial granted.

In the Chancery case against the same parties, the injunction against the Equator was dissolved.

In the Chancery case of the New Discovery Lode against the Little Chief, at Leadville, the suit was discontinued by the plaintiff, and a suit of ejectment was instituted.

THE PROPOSED LAND-SURVEY DEPARTMENT.

DENVER, Colo., February 4.—The State Legislature has unanimously passed a memorial to Congress, which Gov. Pitkin has signed, protesting against the change in the system of land surveys proposed by the National Academy of Sciences. The memorial sets forth the peculiar hardship which the change would work to miners especially, and the people generally, and concludes with a summary of the difficulties which would attend the transaction of business at Washington instead of at local-survey offices, all of which would be abolished by the proposed system.

DAKOTA.

BLACK HILLS.

From the *Pioneer* of the 25th of January we learn that grading for the monster mill that is to be built for the Old Abe and Giant Consolidated Mining Co. was begun on the 13th of January. Laborers receive $2.50 per day.

The sale of two thirds of the Golden Prospect mine, to Beary & Co., for $685.50 is reported. Sale by the sheriff under the hammer.

The old De Smet mill is undergoing a thorough overhauling, preparatory to starting up on Golden Terra ore.

Mr. Furguson, of Bear Butte, says that a very rich body of ore has been struck in the Florence mine. The face of the tunnel shows a vein at least two feet thick, richly impregnated with horn-silver.

The Sunshine lode has been bonded to E. C. Smith and A. A. Dewey for $10,000. This mine lies between the Caledonia and the Alpha, two of the richest mines in the hills. The bond is for a long period of time, and ore is to be milled at once.

Twenty dollars to the ton was cleaned up at Smith & Crane's steam arastra at Bald Mountain from Trojan ore.

The Golden Terra thirty-stamp mill has started up again.

The Anchor Mine, Strawberry Gulch, is said to have struck a very large body of high-grade ore. The New York company who purchased the property intend to erect a sixty-stamp mill in the spring.

MISSOURI.

We take the following from the *Granby Miner* of the 1st inst:

"Neutral mineral is the main thing in Joplin. We understand that last week the Lone Elm Company bought about 600,000 lbs. of mineral. This includes the amount raised on their own lands, as well as neutral, though we presume the amount of the latter far exceeded the former. The arrangements for handling and reducing ore at the Lone Elm works are most perfect. The crude ore goes into their furnaces at one end, and passing through all the processes of weighing, crushing, jigging, smelting, refining, etc., when it has traveled a distance of a hundred yards or so, it is passed into cars on the Joplin railroad track, in the form of white lead of commerce or the best refined Missouri, not only ready for but on its way to market. Great improvements have certainly been made in the reduction of lead ore the past few years; 75,000 to 100,000 of mineral per day are roasted, smelted, and reduced, including 12,000 lbs. of lead carbonate.

"Joplin owes a debt of gratitude the Lone Elm Company for the integrity and energy with which it has sustained the mines and miners, as well as the commercial interest of Joplin and the Southwest.

"The mines at Webb City are looking up, and miners are encouraged. The rise in mineral was a universal theme of congratulation during the first of the week, and many old shafts and prospects that have not been looked into for a couple of years or more are now being explored and searched by miners.

"There is a general tone of encouragement throughout the mines of the Southwest. Miners no longer look for bonanzas. They will be satisfied with a good plain prospect. And really, a moderate prospect will now pay as well as a bonanza did a year or two ago."

"We are assured that the Joplin Railroad will be completed to the line of the St. L. & S. F. Railroad by the first of July next, and to Fayetteville, Ark., by the first of January."

MONTANA.

The Snake River Country, Idaho, promises to be the favorite gold region in 1879. It was discovered too late in the fall of 1878 to allow of any extensive prospecting, but hundred of persons believing in its richness have already located claims on the banks of the river in the vicinity of Blackfoot, Idaho. Blackfoot, on the 1st of January, was made the terminus of the Utah & Northern Railroad, and on that day the first train was run to it.

The town is within a short distance of the river, and has already commenced to feel the advantage of direct railroad communication. The gold excitement, and being the end of railroad communication to Montana, is giving it an exceedingly rapid growth. Your correspondent passed through this district early in January, and for a distance of 15 miles on each side of Blackfoot noticed the white stakes indicating the boundary lines of claims. The metal heretofore found has been in the form of "flour gold," and has been passed by miners as of no value, owing to the difficulty of catching it by the ordinary process of sluicing. We understand some Salt Lake parties have discovered, and are carefully experimenting with, an invention which promises to hold all this fine gold, which otherwise would be carried away. If this proves a success, ground that would otherwise have no value will become at once paying property, and ground that has been worked once will be re-worked. We will endeavor to gather some reliable information as to its practical results and report at an early day. Snake River is 1100 miles long, and if it proves all that is claimed for it, will be, indeed, an immense gold field. We will give this district a more extended notice shortly. From what we have already seen, we would advise every one not to go there before spring, as the region is exceedingly barren and desolate, and the cost of living very high. The river is now frozen over, and no work can be done until water can be obtained.

NEVADA.

From the Comstock we have the following report, dated Jan. 29th:

"The bullion yield of the Comstock for December was $1,028,500, and, judging from the present outlook, that for the month of January will show considerably larger figures. The California, Justice, and Trojan are crushing the usual amount of ore, while both the Ophir and the Consolidated Virginia have increased their ore productions in order to meet the larger demands of the Carson River mills, which, owing to the late rains, are again enabled to crush to their full capacities.

"At the Sierra Nevada the south winze has reached the 2300 level, having for several yards again cut through a spur of fine ore, the cap-rock showing all the favorable features exhibited on the 2200 level.

"The Yellow Jacket shaft has only 50 feet more to sink to connect with the east drift on the 2200 level, which corresponds to the 2400 level of the Imperial, and will furnish a much-needed outlet for the water." The Savage broke a pump-rod, and this resulted in the flooding of some of the adjoining mines. The importance of the Sutro Tunnel is every day more and more evident. It is proposed to make a few large pumping-stations for the entire vein, and drain all the mines into them. The plan is, of course, represented by its proposer, as cheaper than to pay the Sutro Tunnel its $2 a ton. The plan seems, however, to be merely 'bluff,' and as the act of Congress gives the Sutro Tunnel a right to $2 a ton from the time the tunnel is ready to benefit the mines, the adoption of this new plan would not relieve the companies of their liability to the Tunnel company.

The "ring" papers speak of the matter as though the question were simply one of whether the companies shall pay Sutro or adopt another plan, apparently forgetting that the Act of Congress is a contract of the most binding kind, and that they are bound to pay the Tunnel, whether they like it or not.

THE ST. LOUIS MINE.—The exploring drift from the Silver Hill workings is now in over 400 feet and progressing at the rate of about five feet per day. At that rate the middle of the St. Louis ground (which is 1200 feet long from north to south) should be reached in about six weeks.

NEW PATENTS.

The following is a list of the new inventions relating to Iron, Coal, Mining Machinery, Chemical Apparatus, and the treating of Precious Metals, etc., from *The Official Gazette of the United States Patent Office*, for the week ending January 7th, 1878:

No. of Patent.	*Title of Invention.*	*Name of Inventor.*	*Residence.*
211,099	Steam-Boiler Attachment	George Kratz	Evansville, Ind.
211,100	Mining-Machine	F. M. Lechner (a)	Waynesburg, Ohio.
211,108	Compound for Artificial Stone	John S. Randolph (b)	Peoria, Ill.
211,125	Hydraulic and Wire-Rope Pumping System	William P. Barclay	Virginia City, Nev.
211,143	Steam-Motor	Thomas B. Fogarty	Brooklyn, N. Y.
211,153	Dredging Apparatus	Albert E. Hall	Boston, Mass.
211,174	Elevated Railway	Joseph Miller (c)	New York, N. Y.
211,179	Crushing-Rolls	John Peters	Brooklyn, N. Y.
211,194	Apparatus for Carbureting Air	Nathaniel Tackeberry	Perryville, Mo.
211,216	Gas-Regulator	Alex. C. Blount	Pensacola, Fla.
211,248	Amalgamator	Justin Michel	Nevada City, Cal.

(a) Assignor to the Lechner Mining Machine Co., Columbus, O.
(b) " of half his right to Louis F. Menage, Minneapolis, Minn.
(c) " " " " James G. Coffey, same place.

January 14th, 1879.

211,299	Stuffing-Box for Steam-Engine	Charles G. Jerome	Chicago, Ill
211,311	Dynamo-Electric Machine	Edward Weston	Newark, N. J.
211,316	Disintegrating Mill	Lewis J. Bennett	Buffalo, N. Y.
211,350	Steam-Boiler	J. M. Simpson	Oshkosh, Wis.
211,364	Ore-Mill	John Rabbe (a)	S. Windham, Conn.
211,365	Amalgamator	" " (b)	" "
211,385	Torpedo for Oil-Wells	Jerome Douglass	Jefferson, Pa.
211,404	Electro-Magnetic Motor	Charles A. Hussey	New York, N. Y.
211,414	Pump	David P. Maurose	Riverton, Iowa.
211,439	Feed-Water Heater	H. Chiazzari de Torres	Turin, Italy.

(a) Assignor of half his right to Charles Smith, same place
(b) " " " " "

Operations of the Patent Office for 1878.—The business of the Patent Office during the year just closed shows a slight decrease, as will be seen on comparing the issues for the past two years, which are as follows:

	Patents.	Re-issues.	Designs.	Trade-marks.	Labels.
1877	13,120	568	699	1,216	392
1878	12,345	509	590	455	492
Decrease	775	59	109	761	Inc., 100

Reviving the Patent Law.—WASHINGTON, Jan. 30.—The House Committee on Patents has agreed to report favorably the bill which recently passed the Senate reviving the Patent law.

The Woodbury Planing-Machine patent case, after more than thirty years' litigation, was decided by Judge Lowell, in Boston, yesterday, who held that the patent could not be sustained. It is said the patent, if sustained, would cover nearly all the planing-machines in the United States, valued at more than $30,000,000.

PROPOSALS.

For the benefit of many of our readers, we compile weekly such proposals and solicitations for contracts, etc., as may be of interest. The table indicates the character of proposals wanted, the full name and address of parties soliciting, and the latest date at which they will be received:

Five Thousand Feet of Logs; George S. Lee, Lake City, Colo	
Army Transportation; Charles H. Tompkins, Deputy Q. M. Gen., U. S. A., St. Paul, Minn	Feb. 10, 1879
School-House, Material and Labor necessary to build; Isaac Adler, Board of Education, Cincinnati, Ohio	" "
Carriages and Cabs for American District Express; Manager, Broad and Chestnut streets, Philadelphia, Pa	" 15, "
Plumbing, Heating Apparatus, Boilers, Engines, Shafting, Laundry and Cooking Apparatus, Electric Bells, Telephones, for State Hospital, Southern District of Pennsylvania; A. J. Ourt, M.D., Secretary, 1224 Chestnut Street, Philadelphia, Pa	" 17, "
Monument—Granite and Bronze; M. Nichols, Chairman Monument Committee, Buffalo, N. Y.	March 1, "
Grading Market street, Trenton, N. J.; Robert S. Johnston, Trenton, N. J.	" " "
Gas Illumination of Rio de Janeiro, Brazil; Salvador de Mendonca, Brazilian Consul-General, 42 Broadway, New York City	" "
Lighting, Furnishing Material, Repairing, etc., 116 Naphtha Lamps, for 2 years; J. G. Tuerk, City Clerk, Davenport, Iowa	" 4, "
Locks and Keys for Mail Bags; D. M. Key, Postmaster-General, Washington, D. C.	" 20, "
Coal for Schools of Youngstown Board of Education, Youngstown, O.	" 29, "
Railroad Grading; P. Bremond, President of the Houston, East & West Texas Railway, Houston, Tex.	
Railroad Grading; 75 miles: P. Bremond, President Houston, East & West Texas Railroad Co., Houston	
Foreign Contract.—To lay and work up a submarine cable, between Luzon (Philippine Islands) and the coast of China; Ministerio de Ultramar, Madrid, Spain	

Water-works are wanted at Yankton, Dakota.

An election will be held at Golden, Colorado, on the 25th of February, to vote upon the question of issuing bonds of the town of Golden, to be applied to the establishment of a system of water-works, etc.

At a meeting of the Philadelphia Common Council on the 4th inst., the following communication was read: "To the Select and Common Councils of the City of Philadelphia: Gentlemen—In connection with Mr. P. L. Weimer, I bid for the Frankford Pumping-Engine. While our bid was higher in price than the Messrs. Cramp's, ours was the best for the city, for we proposed to construct two separate and distinct engines, which could be operated separately or combined if required. Being informed that the city propose to contract for another engine for these works of the same capacity (10,000,000 gallons per day), I would respectfully ask that our former proposition be again examined by the Committee on Water, and if it shall appear that we are the best bidders, the contract for the proposed engine be awarded to us. HENRY P. M. BIRKINBINE."

It was then stated that Councils had made two appropriations for the Water Department, one of $50,000 and another of $100,000, and it was proposed to subdivide the expenditure of this money as follows: Of the $50,000 appropriation $38,500 was set apart for an engine, etc., for the Frankford Works, and $11,500 for a water main to the East Park Reservoir; of the 100,000, $40,000 was set apart for an engine, etc., for the Spring Garden Works, $20,000 for boilers, $15,000 for an engine-house, $15,000 for a stand-pipe in the East Park, and $10,000 for mains and other purposes.

THE COAL TRADE REVIEW.

NEW YORK, Friday Evening, February 7, 1879.

Anthracite.

The coal trade of this country is now entering upon an era of great and rapid growth. Never before in our history were the prospects so encouraging; not that we look for the high prices and fabulous profits of the "war" times; but we look for such a sound and rapid growth in the demand for coal at low prices, that our production will become enormous. The effort made to increase the price of an article that was a drug in the market was unsuccessful; but the natural laws of trade, which bring about an increased demand by means of low prices, will bring about more remunerative prices in the only rational manner, namely, by the demand equaling the supply. Increase the demand, is the true way to bring about better prices, and we look for a marked improvement in this direction during the next year.

There has been a very good demand for stove and chestnut sizes, and especially for chestnut, which is in very light supply. The larger sizes are somewhat dull of sale with some of the companies.

There are no indications of a combination, although the signs on Wall street are, that rumors to that effect are about to be resumed. We hear less demand from the trade for a combination than at any time during the past three years; and outside of a few who hope to force some arrangement upon the companies, there is a more hopeful feeling than has been observed for a long time. The outlook for a large demand is very encouraging, and better prices, especially during the last half of the year, seem inevitable.

There is but little change in prices from those of a week ago. The Philadelphia & Reading Coal and Iron Co. quotes f. o. b. Port Johnston as follows:

	Broken.	Egg.	Stove.	Chestnut.
Hard white ash	$2.80	$2.80	$2.90	$2.50
Free burning	2.50	2.50	2.90	2.50
Lykens Valley	....	3.75	4.15	....

The Philadelphia & Reading RR. Co., under date of the 6th inst., issued the following circular:

"Hereafter, and until further notice, coal shipped by individual operators will be consigned to Elizabethport instead of Port Johnston.

"The rates of freight and tolls announced in Circular No. 13, dated January 7th, 1879, will apply to shipments to Elizabethport."

An effort is being made to remove all toll charges on coal carried on the Erie Canal.

The production of anthracite coal last week was 400,686 tons, as against 371,706 tons the previous week, and 252,983 tons the corresponding week of 1878. The total production from January 1st to February 1st was 1,440,200 tons, as compared with 1,211,022 tons for the like period of last year, showing an increase this year of 229,178 tons.

Bituminous.

There is some business doing, but it is of an unimportant nature. Some Clearfield Coal has been sold so low as to lead to the belief that concessions in tolls have been made during the last two months by the Pennsylvania Railroad Company. There are indications that the competition for trade will be very great this year, and upon the whole the outlook for the bituminous interests of the East is not encouraging.

There has been nothing done in gas-coal yet. The indications are, that the business will be late, small, and of a hand-to-mouth nature. Prices will probably be lower. The business in Provincial coals will probably be about the same as in 1878, while but little if any change in prices is likely to occur.

The best English gas-coals can be discharged here at a cost not exceeding $3.75.

The Philadelphia *Ledger* has adopted views similar to those previously advanced by us. After repeating what had previously been said in the ENGINEERING AND MINING JOURNAL about the cause of the low quotations for coal, the *Ledger* goes on to say:

"We believe the question of a combination for 1879 has been effectually decided in the negative by the refusal of one or more of the companies in the late combination and certain individual operators to meet the other interests in December. The statements in the annual reports of the Philadelphia & Reading Railroad Company and the Lehigh Valley Railroad Company would seem to indicate that both of the companies named believe themselves to be better off without than with a combination, and, if report upon the subject is correct, the very able gentleman who acts as receiver for the Central Railroad of New Jersey has become a convert to the plan of independent action for the future. From all quarters we hear of the probability of increased demand and consumption of coal; the iron trade shows some signs of revival, and it is certain that in malleable iron at least the demand and production will be very greatly increased over those of last year. It can not be long before the demand for coal will reach the capacity to produce. We know it is quite customary to refer to the annual capacity of the coal-fields as 30,000,000 of tons, and while it is perhaps true that, if every colliery could run continuously during the year at its maximum capacity, with no detention due either to want of cars or vessels, or to snows, ice, floods, droughts, or strikes, the present yearly productive capacity would be about 30,000,000 tons, yet it must be admitted that the maximum practicable business capacity is less than 24,000,000 of tons. The largest shipment ever made in the first six months of the year was 9,875,919 tons, in 1877, when all the companies were in full, active competition, and had the benefit of the reduced output of 1876. The largest production in the last six months of any year was 13,554,902 tons, in 1875, when there were no restrictions upon production, and when, due to the long strike of the early portion of the year, the market was entirely bare of coal and each company had an almost unlimited demand for its product. The aggregate of these two amounts, or, say, in round numbers, 23,500,000 tons, would doubtless be very near to what the actual and practicable production could be brought up to in 1879; and when it is considered that the market will certainly take from 21,000,000 to 22,000,000 of tons this year, it would seem the part of the highest wisdom in the management of our coal companies, if each, instead of attempting to drive an unwilling competitor into combination, would seriously incline its attention to the management of its own affairs, and to the task which is always the most welcome to the shareholders, namely, that of making as much money as possible out of the trade. We understand that the experience of the Reading Railroad Company and of the Lehigh Coal and Navigation Company, in their first month of open competition since the disruption of the combination, has demonstrated the correctness of the view taken by the managers of the first of the two companies named in their last annual report. The Lehigh Navigation has never before done so well in the month of January. The coal tonnage of the Reading Company for January of each of the years named has been as follows: 1874, 236,203; 1875, 95,027; 1876, 219,564; 1877, 343,747; 1878, 231,323; 1879, 453,853; and we are told that this increase of 110,000 tons over the highest amount ever sent in January has been followed by net profits showing a very much greater proportion of increase. The outlet to New York by railroad has been of great service to the company for its winter business, and bids fair to meet the large success anticipated.

"The coal trade looks well. We have taken some pains to ascertain the fact, and find that the coal has been carried from the mines to Port Johnson at one half of the price at which it is sold at the latter point. The prices for January have been as follows:

	Broken.	Egg.	Stove.
Hard white-ash coal	$2.80	$2.80	$3.05
Free burning "	2.50	2.60	3.00
Lykens Valley coal	4.10	4.10	4.10

"Taking into account the quantity of each kind and size shipped, the average for the month is reported at $3.12 per ton, which gives for the coal at the breaker $1.56 per ton, and a like sum for the transportation of about 188 miles. As the cost of transporting coal on the Reading Railroad is about six tenths of a cent per ton per mile, it will be seen that even at the low rate named there is some profit for the transporter in addition to that of the miner. At all events, the experiment of a winter outlet for Schuylkill coal and winter work for Schuylkill County miners has been successful, and we are glad to note that at the few collieries in the Schuylkill region where the delay in the payment of wages was made an excuse for a strike, the workmen have petitioned to be allowed to go to work, and their request has been granted by the company. As a great deal of very sensational matter has been published on the subject of the delay in the payment of the wages of the colliery employés of the Philadelphia & Reading Coal and Iron Company, it may be well to state authoritatively that one half of all December wages is already paid; that the remaining half will be paid this week, when the company will owe nothing but the January wages, which, it is expected, will be promptly paid at the usual pay-days. From all we can learn, we are satisfied that the greatest part of the agitation upon the subject of a strike in the Schuylkill coal region comes from those who are not in the employ of the Reading Coal and Iron Company, but are probably acting in the interest of some secret society, that, for political or other ends, would be quite willing to keep the workmen of Schuylkill in idleness, for reasons not difficult to surmise. We are assured that it is the intention of the Reading Coal and Iron Company to pay its miners promptly. The officers of the company inform us that the delay in the payment of the December wages was due to the very large amounts which had to be provided for the January interest and rentals, and we are told that since January 1st the Railroad Company and the Coal and Iron Company have paid out in cash, for interest, rentals, and wages, the large sum of $1,412,000, and, in addition thereto, have redeemed $396,150 of their wages certificates, making a total of $1,808,000, the payment of which, in the present condition of the company's credit, has made it necessary temporarily to allow some arrearages of wages to accumulate, nearly all of which are now discharged."

THE LONDON COAL TRADE seems as large as might be expected, considering the enormous population, which is nearly as great as that of the whole State of New York. There were brought to the city in 1878 8,794,576 tons, against 8,591,683 tons in 1877. Of the receipts in 1878, 3,198,309 tons, or 36·4 per cent, were by sea, the rest by railroad and canal—substantially all by rail. The Midland brought the most—1,731,039 tons. The London & Northwestern follows, with 1,260,742 tons. Of the total London receipts 2,115,446 tons—nearly a quarter of the whole—were exported or shipped out of London—just about half of it exported. The average price in London in 1878 was about $4.60 per ton. The city consumption would appear to be about 6,700,000 tons. The English railroads have to compete with sea-going vessels for their coal freights; but it does not appear that this compels them to make as low rates as are often had in this country. Just what the rates to London are, however, we do not learn. For interior shipments, similar freights (pig-iron, for instance) are made for distances of a little more than 100 miles at the rate of a little less than two cents per ton per mile.

REPORT OF THE CINCINNATI CHAMBER OF COMMERCE.—The following table shows the average annual quotation at Cincinnati for the various kinds of coal during a period of four years:

Kinds—per bushel.	Afloat. 1877-78.	1876-77.	1875-76.	1874-75.
Pittsburg (Youghiogheny)	7·86	7·96	8·3	9·32
Ashland	6·12	6·75	7·09	8·3
Ohio River	5·82	6·19	5·97	6·63
Hocking Valley	†9·3	†9·98	†10·05	†9·94
Raymond City	*6·5	*7·3	*7·62	*8·35
Muskingum Valley	*3·17	*9 43	*9·72	*9·94
Campbell Creek	7·1	....	....	....
Cannel	13·0	15· 3	16·14	17·3

* On arrival. † At elevator.

THE CUMBERLAND COAL-MINE FIRES.—The Frostburg *Journal* notes that the subterranean fires in the mines near Pompey Smash, that have been blazing for several years, are spreading, and will ultimately threaten

a large body of coal belonging to the Consolidation Coal Company. The *Journal* warns the companies owning property near the fire to take some action to arrest its progress.

PRODUCTION OF COAL IN NORTHERN PENNSYLVANIA.

We are indebted to Mr. James Macfarlane for the following statistics:

SEMI-BITUMINOUS COAL.	1877.	1878.	Increase or Decrease.
Fall Brook Coal Co	199,510	228,698	Inc ..29,188
Morris Run Coal M. Co	181,001	202,162	Inc ..21,161
Blossburg Coal Co	221,734	221,737	Inc .. 3
Total Blossburg Region	602,245	652,597	Inc ..50,352
Ralston and Barclay Region:			
McIntyre Coal Co	183,715	154,205	Dec..29,510
Schneder Coal Co	175,755	149,285	Dec..26,470
Towanda Coal Co	164,344	165,035	Inc .. 691
Total Northern Pennsylvania..	1,126,057	1,121,122	Dec.. 4,937
Semi-Anthracite of Loyalsock Coal Co	19,502	35,727	Inc ..16,225

DELAWARE, LACKAWANNA & WESTERN RR. CO.'S REPORT.

We take from the *Railroad Gazette* the following:

This company, with 195·80 miles owned and 463·15 leased, besides large coal properties, owned and controlled, makes no detailed report, but the following brief statements for the year 1878 are published:

The condensed balance-sheet at the close of the last two years is as follows:

	1878.	1877.	Inc. or Dec.
Stock	$26,200,000	$26,200,000	....
Bonds	5,887,100	3,015.100	I..$2,872,000
Net floating debt	.....	1,693,170	D.. 1,693,170
Surplus	4,346,125	4,305,415	I... 40,710
Total	$36,433,225	$35,213,685	I..$1,219,540
Construction	28,760,904	28,817,018	D.. 56.114
Materials on hand	838,271	983,402	D.. 145,131
Stocks and bonds	5,155,656	4,608,400	I... 547,256
Changing gauge	863,644	804,865	I... 58.779
Net surplus	814,750	.....	I... 814,750
Total	$36,433,225	$35,213,685	I..$1,219,540

The bonded debt consists of $1,633,000 second-mortgage bonds; $600,000 convertible bonds; $587,100 Lackawanna & Bloomsburg bonds, and $3,067,000 consolidated bonds. The amount of consolidated bonds outstanding was increased $2,872,000 during the year; there were no other changes. The following statement is given of securities owned, chiefly those of leased lines, and rated at par value:

Delaware, Lackawanna & Western stock	$979,300
Syracuse, Binghamton & New York stock	1,575,000
Valley RR. stock	747,000
Utica, Chenango & Susquehanna Valley stock	581,100
Warren RR. stock	10,000
Morris & Essex stock	319,850
" " consolidated bonds	1,277,000
Greene RR. bonds	185,000
Sundry stocks and securities	639.575
Total par value	$6,313,825

The income account for the year was as follows:

Transportation Department receipts		$7,611,884
Coal sales		6,509,914
Miscellaneous		360,986
Total		$14,482,784
Expenses, Transportation Department	$4,065,916	
" Coal Department	6,677,708	
" barges and sundries	87,726	
		10,831,350
Net receipts		$3,651,434
Interest account	$411,966	
Rentals of leased lines	3,198,759	
		3,610,725
Balance to income account		$40,709
Balance, surplus Dec. 31st, 1877		4,305,416
Balance, surplus Dec. 31st, 1878		$4,346,125

According to this statement, the net transportation receipts were $3,545,968, while there was a loss of $167,794 on the Coal Department. The company's statements for two years compare as follows, including miscellaneous receipts and expenses with transportation:

	1878.	1877.	Inc. or Dec.	P. c.
Net transportation earnings	$3,819,228	$4,401,851	D. $582,630	13.2
Losses on coal	167,794	1,922,661	D. 1,754,867	91.3
Balance	$3,651,434	$2,479,197	I. $1,172,237	47.3
Interest	411,966	201,957	I. 210,009	104.0
Rentals	3,198,759	3,185,261	I. 13,497	0.4
Total charges	$3,610,725	$3,387,219	I. $223,506	6.6
Surplus	.....	$40,709	.....	..
Deficit	.....	.....	$908,022	....

The surplus this year, though only 0·155 per cent on the stock, was an improvement on the deficiency of last year, which was 3·46 per cent on the stock. A statement of the company's condition at the close of the year is as follows:

Coal bills, agents' accounts, etc		$1,631,610.27
Advances on coal to be delivered		465,562.43
Advances to leased roads		299,083.35
Bills receivable on hand		27,874.60
Coal on hand		387,499.27
Cash		199,712.57
Total assets		$3,011,292.49
State taxes, payable by May 1st	$203,019.51	
Vouchers and accounts payable	434,694.20	
Interest accrued to Dec. 31st	141,489.82	
Rentals payable on and after Jan. 1st	1,041,502.60	
December pay-rolls, etc	225,734.92	
Bonds and mortgages on real estate	150,101.13	
		2,196,542.18
Balance, net surplus		$814,750.31

The company has no bills payable or demand loans outstanding. The value of materials on hand, Dec. 31st, was $838,271. The financial condition has apparently improved during the year, though the funded debt has been considerably increased. It is still, however, small in comparison with the stock.

It is to be regretted that the company does not publish a detailed report, which would be of much interest.

The total coal tonnage was 2,571,470 tons, an increase of 201,590 tons, or 8·5 per cent, over 1877. Only 12 out of the company's 18 collieries were worked during the year, and only an average of 137½ days' work was done at each of the 12, or about 11½ days per month for each colliery worked, and 7½ days per month for each colliery owned. At the mines leased or contracted, about the same average of work was done, so that the tonnage could have been increased to 5,000,000 tons without difficulty.

WELSH COAL AND IRON EXPORTS.—Cardiff, Wales, exported in 1878, 69,772 tons of iron against 80,838 tons in 1877. The shipments of coal, however, make a more favorable showing, having been as follows:

	1877. Tons.	1878. Tons.
Exports of coal	3,658,083	4,019,275
Coal shipped coastwise	844,500	819,671
Exports of coke	16,121	14,174
Exports of patent fuel	99,094	108,463
Total	4,617,798	4,961,583

Swansea exported 686,192 tons of coal in 1878, and 653,630 tons in 1877. Newport exported, in 1878, 772,503 tons of coal, and in 1877, 611,156 tons.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, February 7, 1879.

American Pig.—At last the iron market has begun to feel an improvement. There has come up suddenly a well-distributed demand, which has already resulted in considerable business, and there is a much better feeling throughout the trade, it being the general belief that the turn for the better has actually come at last. The Thomas Iron Co. announces sales of 15,000 tons of iron during the past two weeks at $17.50 for No. 1 Foundry and $16 for No. 2 Foundry, and is not anxious to contract at these figures. Although much of a recovery can not be expected, it looks as though some advance would take place during the next sixty days. We quote, according to brand, as follows: No. 1 Foundry, $16@$17.50; No. 2 Foundry, $15@$16.50, and Forge, $14@$15.

Scotch Pig.—The market has been very quiet, but is firm. We quote Eglinton at $19.50@$20 and Coltness at $22@$22.50.

Rails.—Owing to the abundance of orders held by the steel mills, prices continue to improve. We note a sale of 3000 tons, at about $42 per ton, at one of the Eastern Pennsylvania mills. There is still a very good inquiry. We quote at mills $42@$44. Iron rails are in more demand this year. We quote at this port $36@$37.

Old Rails.—We learn of no business. The asking price is generally $20.

Wrought Scrap is scarce. We note sales of 300 tons at $21, and 100 tons at $22.

SCOTCH PIG-IRON MARKET, REPORTED BY WM. COLVIN & CO.

GLASGOW, January 21, 1879.

The Warrant Market showed a little firmness last week, and the price advanced about 3d. per ton, closing on Friday at 42s. 6d. cash. On Monday, business was done from 42s. 7d. to 42s. 9d. cash, closing with sellers at the higher price, and buyers at 42s. 8d. To-day, a few lots changed hands at 42s. 9d. and 42s. 10d cash, closing with buyers at the former price and sellers at the latter. There is little or no change to report in the value of Makers' Iron. The Middlesbrough Weekly Market to-day is reported unchanged; No. 3, 34s. net.

	No. 1. s. d.	No. 3. s. d.
G. m. b. at Glasgow (deliverable alongside)	43 6	42 6
Gartsherrie, " "	48 6	45
Coltness " "	50 6	45 6
Summerlee, " "	48	43 6
Langloan " "	51	45
Carnbroe, " "	45	44
Monkland, " "	43 6	42 6
Clyde, " "	44	43
Govan, at Broomielaw, "	43 6	42 6
Calder, at Port Dundas, "	49	43 6
Glengarnock, at Ardrossan, "	46 6	43 6
Eglinton, " "	43	42
Dalmellington, " "	43	42
Carron, at Grangemouth, "	60	57 6
" " specially selected (deliverable alongside)	65	.....
Shotts, at Leith (deliverable alongside)	50 6	46
Bar-iron	£6 5 to £6 10s.	
Nail-rods	6 15	

SHIPMENTS.

	Tons.
For week ending January 18th, 1879	6,291
" " January 19th, 1878	4,532
Increase	1,759
Total increase for 1879	4,838

IMPORTS OF MIDDLESBROUGH PIG-IRON INTO GRANGEMOUTH.

For week ending January 19th, 1878	3,897
" " January 18th, 1879	2,643
Decrease	1,254
Total decrease for 1879	5,468

FURNACES.

In blast, January 18th, 1879	91
" January 19th, 1878	87

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STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative statement for the week ending Feb. 1st and years from January 1st:

TONS OF 2240 LBS.	1879.		1878.	
	Week.	Year.	Week.	Year.
Wyoming Region.				
D. & H. Canal Co..	55,795	218,155	40,778	247,995
D. L. & W. RR. Co.	67,958	253,844	40,980	200,958
Penn. Coal Co.....	23,616	75,055	9,708	57,940
L. V. RR. Co.....	9,120	54,293	23,474	98,534
P. & N. Y. RR. Co..	622	1,756	512	1,609
C. RR. of N. J.....	37,893	86,373	3,917	72,000
	195,004	689,476	119,369	679,036
Lehigh Region.				
L. V. RR. Co.....	37,700	155,785	65,425	223,959
C. RR. of N. J.....	41,438	124,628	9,982	60,208
S. H. & W. B. RR..	1,794	2,034	674	674
	80,932	282,447	76,081	284,841
Schuylkill Region.				
P. & R. RR. Co	120,142	436,460	50,206	210,171
Shamokin & Lykens Val.....	3,536	26,832	6,695	33,466
	123,678	463,292	56,901	243,637
Sullivan Region.				
Sul. & Erie RR. Co.	1,072	4,985	632	3,508
Total	400,686	1,440,200	252,983	1,211,022
Increase.....	147,703	229,178	.....	.....
Decrease	.....	.....	.....	.....

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent of the whole production.

Belvidere Delaware Railroad Report for week ending Feb. 1st:

	Week.	Year. 1879.	Year. 1878.
Coal for shipment at Coal Port (Trenton)	.....	.....	.....
Coal for shipment at South Amboy	6,783	20,636	81,496
Coal for distribution.....	8,290	24,967	15,857
Coal for Company's use	2,123	7,876	10,053

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania railroads, amounts to 14,553 tons, as compared with the corresponding period in 1878.

The Production of Bituminous Coal for the week ending Feb. 1st was as follows:

Tons of 2000 lbs., unless otherwise designated.

	Week. Tons.	Year. Tons.
Cumberland Region, Md.		
Tons of 2240 lb	13,587	61,535
Barclay Region, Pa.		
Barclay R. R., tons of 2,240 lbs.....	6,331	26,758
Broad Top Region, Pa.		
Huntingdon and Broad Top R. R.....	2,283	11,003
*East Broad Top.....	1,302	4,403
Clearfield Region, Pa.		
*Snow Shoe.....	747	2,427
*Tyrone and Clearfield..... 21,700		59,669
Allegheny Region, Pa.		
*Pennsylvania R. R	3,367	9,187
Pittsburg Region, Pa.		
*West Penn R. R.....	4,317	10,663
*Southwest Penn. R. R.....	804	2,046
*Penn & Westmoreland gas coal, Pa. R. R..... 12,065		38,251
*Pennsylvania R. R.....	8,472	23,201

*For the week ending Jan. 21st.

The Production of Coke for the week ending Jan. 21st:

Tons of 2000 lbs.	Week.	Year.
West Penn R. R....	2,079	5,861
Southwest Penn. R. R.....	20,800	51,368
Penn. & Westmoreland Region, Pa. R. R.	1,755	5,011
Pittsburg, Penn. R. R.....	3,942	9,670
Penn. R. R. (Allegheny Region).....	1,097	3,262
Total...	29,673	75,172

PRICES OF COAL.

New York.

Wholesale Prices of Anthracite Coal Delivery f. o. b. at Tide Water Shipping Ports, per ton of 2240 lbs.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
WYOMING COAL.	$	$	$	$	$	$
Lackawana, at Weehawken. . . .	2 35	2 32	2 32	2 75	2 40	
*Pittston, at Weehawken...	2 40	2 40	2 40	2 80	2 60	
L. Val. Coal Co., at Amboy.	.....	.....	.....	.....	.....	
Honey Brook Lehigh..... .	3 00	.....	2 85	2 85	2 90	2 60
Wilkes-Barre at Pt. Johnson	2 50	2 50	2 50	2 50	2 90	2 60
Plymouth Red Ash at Port Johnson.....	.....	.....	2 50	2 50	3 10	2 70
Swoyers at Eliz. Pt. or S. A.	2 60	2 60	2 60	2 75	3 20	2 60
LEHIGH COAL.						
Spring Mount, Lehigh, at P. Amboy.....	3 25	3 00	3 00	3 00	3 20	2 70
Cross Creek, at Port John.	3 25	3 00	2 85	2 85	3 00	2 70
Buck Mount. Vein at Elizabeth Port or S. A.....	3 50	3 00	3 00	3 00	3 20	2 60

* Forty cents per ton additional for delivery in New York.

Retail Prices.

Per ton of 2000 lbs,

Anthracite.	G. & Egg.	Stove.	Chest.
Pittston coal delivered.....$3.75		$4.00	$3.75
Lack. coal, delivered below 59th St.	4.00	4.25	4.00

Wholesale Prices of Bituminous Coal.

MANUFACTURING AND STEAM COALS.

Cumberland at Georgetown and Alexandria	2.75@2.90	4.35@4.50	
Cumberland, at Baltimore.....	2.90@3.00	4.35@4.50	
Cl'rfi'd "Eureka" and "Franklin."			
At mines.....	0.75	....	.....
At Baltimore.....	3.25	....	4.50
At Philadelphia.....	3.25	....	4.50

DOMESTIC GAS COALS.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside at New York.
Westmoreland and Penn.....	$4.25	.....
At Greenwich, Philadelphia	.....	$5.50
At S. Amboy.	5.00	5 50
Kanawha at Richmond	4.10	5.40
Red Bank Cannel, Pa., at Philadelphia..	8.00	8.50
Youghiogheny, Waverly Co., at Balt ...	4.00	5.65
Despard, West Va.....	4.50	6.00
Murphy Run, West Va., at Baltimore...	3.75	5.85
Fairmount, West Va., " " ...	3 75	5.70
Newburg Orrel. Md. " " ...	3.75	6.00
Cannelton Cannel, West Va	....	10.00
" Splint " at Richmond.	6.00	7.00
" Gas Coal at Richmond	4.00	5.65
Peytona Cannel, W. Va., at Richmond...	....	10.00

FOREIGN GAS COALS.

	Sterling.	Am. cur'ncy
Newcastle, at Newcastle-on Tyne.....	7s.6d.	$2 50@ $3.50
Liv. House Orrel, at Liv.....	25s.	13.00
Ince Hall Cannel "	35s.6d.	18.00
" Gas Cannel "	25s.6d.	10 00@ 10.50
Scotch Gas Cannel, at Glasgow, nominal.....	25s.	7 50
	Gold.	
Bl'k House, at Cow Bay, N.S.	$1.75	$4.50
Caledonia, at Pt. Caledonia.	1.50	4.25
Glace Bay at Glace Bay....	1.50	4.00
Lingan, at Lingan Bay.....	1.50	....
Intern'l Mines, at Sydney...	1.75	4.50
Pictou, Vale Mines, at Pictou	2.00	4.70

Baltimore. Feb. 3, 1879.

[Specially reported.]

Wholesale Prices per ton of 2240 lbs. In cars at Depot N. C. R. R.

HARD WHITE ASH, FREE-BURNING WHITE ASH, SHAMOKIN, ETC.

Lump and Steamboat...$4.05		Stove.... .. ..$4.70	
Broken.....	4.20	Chestnut.	4.05
Egg	4.30		

LYKENS VALLEY RED ASH.

Broken.....$4.40		Stove..... . . .	$4.70
Egg.....	4.55	Chestnut.....	4.15

By cargo afloat, 15c. *less* per ton than car prices. To trade from wharf or yard, 50c. per ton *above* car prices.

Buffalo. Feb. 3, 1879.

[Specially reported by LEE & LOOMIS.]

Connellsville coke, gas, steam, and Cannel coals are offered, for the present, at the following prices per ton of 2000 lbs., delivered at Buffalo:

	Lump.	Run of Mine.	Nut.	Slack.
Connellsville coke...	$4.75	.....	.....	.....
Brookfield Coal.....	3.75	.....	.....	.....
Briar Hill.....	3.50	.....	.....	.....
" " No. 2.....	3.15	.....	.....	.....
Youghiogheny.....	3.75	.....	.....	.....
Monterey.....	.....	.....	.....	.....
Catfish.....	3.10	2.60	2.25	1.85
Stoneboro	.....	2.60	2.25	1.85
Sterling Cannel.....	4.50	.....	.....	.....
Cameron.....	.....	2.80	.....	.....
Buffalo Coal Co.....	.....	2.60	.....	1.85

Terms, equal to cash in New York city funds.

BLOSSBURG COAL.

Per ton of 2000 lbs.

	To dealers.	To consumers.
By car or boat.....	$3.25	$3.25
In yard.....	3.40	3.60
In car.....	.....	3.65
Delivered.....	.....	4 00

	To dealers.		Retail.
	On cars or boats.	In yard, screened.	Delivered.
Grate.....	$4.15	$4.25	$5.15
Egg.....	4.25	4.35	5.25
Stove.....	4.50	4.60	5.50
Chestnut.....	4.00	4.10	5.00
Lehigh Lump.	.....	.....	.....
Blossburg.....	3.25	3.40	4.00

[Specially reported by E. L. HEDSTROM.]

	Lump.	Grate.	Egg.	Stove.	Nut.
Scranton.....	....	$4.55	$4.65	$4.90	$4.40
Wyoming.....	....	4.55	4.65	4.90	4.40
Lehigh (Sugar Loaf)....	.....	.....	.....	....	....

Blossburg, $3.50, F. O. B.

Hamilton, Ont. Feb. 4, 1879.

[Specially reported by H BARNARD.]

Retail prices delivered per ton of 2000 lbs.

Cr. or Wilkes-B. Grate.	$5.00	Lehigh Lump.	$6.25
" " Egg ..	5.00	Brier Hill.....	5.00
" " Stove.	5.15	Massillon	.....
" " Nut .	4.65	Smithing.....	5.00

From wharf or yard to the trade, 50c. per ton additional. Afloat by cargo per canal barge, 15c. per ton less than in cars at depot.

25c. per ton less in cars at Great Western Railway depot.

Indianapolis. Feb. 3, 1879.

[Specially reported by Messrs. COBB & BRANHAM.]

WHOLESALE BITUMINOUS.

On board cars, per ton of 200 lbs.

White River..None in market		Hocking Valley.....	4.20
Brazil Block	$2.10	Raymond City.....	3.40
Highland Grate.....	1.85	Youghiogheny.....	3.70
Indiana Cannel.....	3.65	Blossburg (smithing)..	5.25
Peytona.....	5.70	Piedmont " ..	5.25

Per car, 12 tons.

Block coal, nut.....$15.00		Block Slack.... .....$12.00	
Highland, " 14.00			

RETAIL BITUMINOUS.

Delivered per bushel of 70 lbs.

Raymond City.....14c.		Block Nut, steam use....	6c.
Brazil Block.....10		" Slack, "	5
Highland Grate..... 9		Virginia Cannel.....24	
Block Nut, domestic use.10		Indiana Cannel.....15	
Highland Nut, " " .11		Youghiogheny.....15	
" " steam. ... 8		Blossburg.....24	

GAS COKE.

Per bushel, measure containing 2888 cubic inches.

Retail, crushed.	8c.	Wholesale, lump.....	6½c.
" lump....	7	" crushed....	7½

ANTHRACITE.

Per ton of 2000 lbs.

Wholesale on Cars.		*Retail delivered.*	
Wilkes-Barre, all sizes.	$5.50	Wilkes-Barre, all sizes.	$6.50
Lackawanna, " .	5.75	Lackawanna, " ..	6.50
Lehigh " .	6.75	Lehigh, " ..	7.50

Louisville. Feb. 3, 1879.

[Specially reported by Messrs. BYRNE & SPEED.]

The demand at present is very good, in the city and on railroads.

Wholesale per bushel of 72 lbs.

Pittsburg .....6c.		Kentucky, in river.....5½c.	
Raymond City.....6		Kentucky, on cars.....6	

Retail.

Pittsburg .... 10c.		City made Coke.	7c.
Raymond City..... 9		Gas Coke.....	8c.
Kentucky 8		Cannel Coal.....	17
Hard and soft Coke. .. 8		Anthracite, per ton $7.00	

Milwaukee. Feb. 3, 1879.

Specially reported by Messrs. R. P. ELMORE & Co.]

Retail price per ton of 2000 lbs.

Lehigh prepared, chippings.....		.....@$7.00	
" " lump.....		.....@ 7.50	
Lackawanna prepared (all sizes).....		....@ 6.50	
Briar Hill.....		.....@ 5.50	
Steam cokes.....		.....$3.75@ 4.75	

Montreal. Feb. 3, 1879.

[Specially reported by Messrs. ROBERT C. ADAMS & Co.]

Wholesale per 2240 lbs.

Scotch Steam	$4.50	Cape Breton Steam...	$4.00
Pictou	4.25	Newcastle Smith's....	5.00

Anthracite at retail, per 2000 lbs. delivered.

Stove.....	$6.50	Chestnut.....	$6.00
Egg..	6.25		

New Orleans. Feb. 1, 1879.

[Specially reported by Messrs. C. A. MILTENBERGER & Co.

The only change we can report in the condition of the coal market is a better demand since our last. Prices remain same as last statement. Stock large. Coal on hand Feb. 1st, 1879, 143 boats and 6 barges Pittsburg coal. Consumption during January: 39 boats, 9 barges, 4 French creeks, 1 box boat (2000 bbls.) Pittsburg coal; 1 boat and 1 barge St. Bernard coal. Arrivals: 16 boats and 2 barges Pittsburg coal.

PITTSBURG COAL.

At wholesale (by boat-load).....25@27c.		per bbl. of 180 lbs.	
To steamboats.....40@45c.		"	"
" manufactories.....@40c.		"	"
" families ....45@50c.		"	"
In hhds. (for shipment).... $5.00 per hhd		from 5 to 6 bbls.	

ANTHRACITE COAL

Per ton of 2000 lbs.

At wholesale.....$6.00 to $7.00	
To families etc..... .. 8 50 to 9.00	

ST. BERNARD (KY.) COAL.

To steamboats..... .....40c.		per bbl. of 180 lbs.	
" families .....45c.		"	"
Virginia cannel at retail.....85c.		"	"

Philadelphia. Feb. 6, 1879.

Trade is duller than it was. The constant steady declines in prices, which already represent serious losses to all the interests, render the buyers shy. A good deal of coal is needed at places which can only be reached by water; but the condition of the river here is yet very bad, and for the present receipts are confined to points reached by rail. $2 freight to Boston is asked by some captains, but that rate has not been paid by any one. The trade is forced too early in the season. A little patience and caution would secure remunerative rates, but instead of that we have an eagerness to make sales never witnessed before so early in the season, and it may be said that the trade will likely be spoiled before the regular time for starting has been reached. Dealers want a breathing spell to get rid of coal on hand, and would soon be anxious buyers if producers would wait a little.

Richmond. Feb. 3, 1879.

[Specially reported by S. H. HAWES, Dealer in Coal.]

Per ton of 2240 lbs. f.o.b.

Kanawha Cannel.....	$9.00	New River Bituminous	$3.30
Coalburg Splint	4.50	Clover Hill Coal..	2.50
Lewiston	4.50	Norwood Gas and Kanawha Gas Coal...	4.10
		Steam Coal.....	2.70

Sandusky. Feb. 3, 1879.

[Specially reported by Messrs. BLACK & CLARKE, Agents Con. Coal and Mining Company.]

Per ton of 2000 lbs.

ANTHRACITE.

	Grate.	Egg.	Stove.	Chest
Lehigh.....$6.00		$6 00	$6.25	$5.75
Wilkes-Barre.....	4.80	4.90	5.15	4.65
Pittston.....	4.80	4.90	5.15	4.65

BITUMINOUS.

Massillon.....	$2.85	Straitsville.....	$2.00
Hocking Valley	2.50	Piedmont.....	1.54

Prices retailed delivered 50c.@75c. above car prices.

St. Louis. Feb. 3, 1879.

Reported by JAMES J. SYLVESTER, Secretary of the Anthracite Coal Association.]

Retail prices, delivered. Ton of 2000 lbs.

ANTHRACITE.

	Per ton.		Per ton.
Lackawanna....	$7.50@.....	Lehigh.....	$8.50@.....
Wilkes-Barre...	7.50@.....	Connells. Coke.	6.00@.....
Schuylkill.....	7.50@.....	Blossburg.....	7.75@.....

Feb. 3, 1879.

[Specially reported by Messrs. LEWIS P. HARVEY & Co.]

BITUMINOUS.

Big Muddy....	$3.65	Piedmont.....	$7.25
Indiana Block.	3.25	Pittsburg.....	4.35
Illinois Coals..	2.25@2.50	Peytona	7.50
Blossburg.. ..	7.75	Lehigh Val. Ant..	7.50@8.00

Toledo. Feb. 3, 1879.

[Specially reported by Messrs. GOSLINE & BARBOUR.]

We quote the following as the present prices for coal, f. o. b. on cars here, per ton of 2000 lbs.:

Ton of 2000 lbs.

	Grate.	Egg.	Stove.	Chest.
Pittston.....	$5.05	$5.15	$5.40	$4.90
Wilkes-Barre	5.05	5.15	5.40	4.90
Lackawanna.....	5.05	5.15	5.40	4.90

Lehigh lump, $6.00.

Ton of 2000 lbs.

Straitsville lump.....	$2.60	Massillon nut.....	$2.40
" nut.....	2.25	Willow Bank lump....	2.85
Shawnee lump	2.60	" nut.....	2.40
" nut.....	2.25	Cumberland	5.00
Hocking Valley lump.	2.60	Blossburg.....	4.60
" nut..	2.25	Morris Run.....	4.60
Massillon lump	2.85	Gas Coal	3.25

Retail prices, delivered in the city, are: Stove. $6.00; Grate, Egg, and Chestnut, $5.75.

FREIGHTS.

Coastwise Freights.

Per ton of 2240 lbs.

Representing the latest actual charters to Feb. 6th, 1879.

PORTS.	From Philadelphia.	From Baltimore.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Alexandria	.....	.....	.....
Allyn's Point	.....	.....	.....
Annapolis	.....	.....	.....
Barnstable	.....	.....	.....
Bath, Me	.....	.....	.....
Boston, Mass	1.75	1.75	1.25@1.50
Braintree	.....	.....	.....
Bridgeport, Conn.	.....	1.50	.....
Bristol, R. I.	.....	.....	.....
Brooklyn	.....	.....	.....
Cambridge, Mass.	.....	.....	.....
Charleston	.....	.....	.....
Chelsea	.....	.....	.....
Charlestown	.....	.....	.....
Cambridgeport	.....	.....	.....
Danversport	.....	.....	.....
East Cambridge	.....	.....	.....
East Boston	.....	.....	.....
Fall River	.....	1.50	90
Fulton, Texas	.....	.....	.....
Georgetown	.....	.....	.....
Gloucester	.....	.....	.....
Hackensack	.....	.....	.....
Hartford	.....	1 40	.....
Hoboken	.....	.....	.....
Hunter's Point	.....	.....	.....
Jacksonville	.....	.....	1.50
Jersey City	.....	.....	.....
Lynn	.....	.....	.....
Marblehead	.....	.....	.....
Middletown	.....	.....	.....
Newbern	.....	.....	.....
New Bedford	.....	1.50	.....
Newburyport	.....	.....	.....
New Haven	.....	1.50	.....
New London	.....	1.50	.....
Newport	.....	.....	.....
New Rochelle	.....	.....	.....
New York	.....	1.30	.....
Newark	.....	.....	.....
Norfolk, Va	.....	.....	.....
Norwich	.....	1.60	.....
Norwalk, Conn	.....	1.50	.....
Pawtucket	.....	.....	.....
Petersburg	.....	.....	1.10
Philadelphia	.....	.....	.....
Port Eades	.....	.....	.....
Port Royal	.....	.....	.....
Portland	.....	1.75	1.25
Portsmouth, Va.	.....	.....	.....
Portsmouth, N.H.	.....	2.00	.....
Providence	.....	1.50	1.00
Richmond, Va	.....	.....	.....
Rockport, Mass.	.....	.....	.....
Saco	.....	.....	.....
Sag Harbor	.....	.....	.....
Salem, Mass.	.....	2.00	.....
Savannah	.....	.....	.....
Somerset	.....	.....	.....
Trenton	.....	.....	.....
Wareham	.....	1.60	.....
Washington	.....	.....	.....
W'lmington, Del.	.....	.....	.....
Wood's Hole	.....	.....	1.05

Perth Amboy to Wilmington, N. C., $2.

* And discharging and towing. † And discharging. ‡ And towing. § 3 cents per bridge extra.

LEHIGH VALLEY RR. CO.

To Shippers:

Commencing with Monday, 13th inst., and until further notice, a drawback of 13 cents per ton on tide coal will be paid between Mauch Chunk and Amboy.

ASA PACKER, President.

MAUCH CHUNK, PA., Jan. 14, 1879.

Ocean Freights.

Ocean Freights on coal, iron, etc., per ton of 2000 lbs. to and from foreign and domestic ports, for four weeks ending Feb. 6th, 1879, are given below.

DATE.	From	To	Cargo.	R'te
Jan. 11	Charleston.....	New York.....	†	2.25
" 11	New York.....	Cienfuegos....	Coal....	2.50
" 14	Barren Island.....	Charleston.....	*	1.75
" 14	New York	San. de Cuba...	Coal....	1.50
" 14	Barren Island.....	Wil'ngt'n, N. C.	*	2.00
" 17	Boothbay.....	Savannah.....	*	1.75
" 17	Wood's Hole.....	Pensacola.....	Guano..	1.50
" 24	Inagua.....	Boston.....	Salt....	8c.
" 24	New York.....	New Orleans...	RR. Iron	3.00
" 28	New York.....	St. Jago.....	Coal....	1.75
" 28	Barren Island.....	Norfolk.....	*	1.25
" 30	Barren Island.....	Savannah.....	*	2.00
" 30	Boston.....	Port Royal.....	*	1.25
" 30	Orient.....	Charleston.....	Guano..	1.25
Feb. 1	Philadelphia.....	Charleston.....	RR. Iron	2.25
" 1	Philadelphia.....	Norfolk.....	Guano..	1.25
" 5	Philadelphia.....	Havana.....	Coal....	1.50
" 5	Barren Island.....	Richmond.....	Coal....	1.00
" 5	Bridgeport.....	Richmond.....	‡	1.25
" 5	New York.....	Savannah.....	*	2.00
" 5	New York.....	Havana.....	Coal....	1.10
" 6	New York.....	Charleston.....	*	1.75

* Phosphate. † Phosphate rock. ‡ Old rails.

PRICES OF IRON.

Baltimore. Feb. 3, 1879.

[Specially reported by Messrs. R. C. HOFFMAN & Co.]

The demand for wheel irons continues very fair for the season, and, as the stocks on hand are running very low, prices have an upward tendency. We quote as follows:

Balt. Char....	$26.00@$28.00	M. & White...	$13.00@$14.00
Va. "	26.00@ 30.00	C'lC.B.Blooms	50.00@ 52.00
Anth. No. 1....	19.00@ 20.00	" " Billetts	52.00@ 55.00
" " 2....	18.00@ 19.00	Refi'd Blooms	43.00@ 45.00
" " 3....	16.00@ 17.00		

Buffalo. Feb. 7, 1879.

[Specially reported by Messrs. PALEN & BURNS.]

	Cash.	4 mos.
No. 1 Ex. Foundry	$18.00	$18.50
No. 2 "	17.00	17.50
Mill	16.00	16.50
Charcoal iron (all numbers)	24.50	.....
Lake Superior ores	.....	.....
American Scotch A 1	.....	19.00
" " B 1	.....	17.00
" " No. 2	.....	16.50
" " No. 3	.....	.....
Best selected Connellsville coke, per net ton		4.75

Chattanooga. Feb. 3, 1879.

Specially reported by J. F. JAMES, Dealer in Iron & Metals.]

Tenn., Ala. & Ga. Charcoal, No. 1 Foundry	$16.00@$17.00		
Tenn., Ala. & Ga. Charcoal, No. 2 Foundry	15.00@ 16.00		
Tenn., Ala. & Ga. Charcoal, Gray Forge	13.00@ 15.00		
Tenn., Ala. & Ga. Coke, No. Foundry	18.00@ 19.00		
Tenn., Ala. & Ga. Coke No 2 Foundry	16.00@ 17.00		
Tenn., Ala. & Ga. Coke, Gray Forge	14 00@ 15.00		
Charcoal or Coke, white and mottled	13.00@		
Old rails.....	$18 00@$19 00	Wr'ght scrap,	
Old car wh'ls.	16 00@ 17 00	No. 2.....	$11.00
Wr'ght scrap,		Cast scrap...	10 00
No. 1.....	16 00	Muck bar....	30.00@ 32.00

IRON ORES.

Red hematite or fossiliferous f. o. c. at mines, about 55 per cent metallic iron	$1.25
Brown hematite about 55 per cent metallic iron	1.75

Cincinnati. Feb. 4, 1879.

[Specially reported by Messrs. TRABER & AUBERY, Commission Merchants for the sale of pig iron, blooms, ore, etc.]

Below please find closing quotations of our pig-iron market, viz.:

CHARCOAL.

H'n'g Rock No. 1 Foundry & B 1..	$21.00@$21.50	—4 mos.
" No. 2 "	20.00@ 21.00	—4 mos.
" Soft Silver Gray.....	18.00@ 19.00	—4 mos.
" Mill.....	18.00@ 19.00	—4 mos.
Tennessee No. 1 Foundry.....	20.00@	—4 mos.
" No. 2 "	19.00@	—4 mos.
" Mill.....	18.00@	—4 mos.

STONE COAL.

Ohio No. 1 Foundry.....	$16.50@ 17.00	—4 mos.
" No. 2 "	15.50@	—4 mos.
" No. 3 "	14.50@	—4 mos.
" No. 4 "	13.50@	—4 mos.
" Mill.....	16.00@	—4 mos.

COKE.

Ohio & W. Va. No. 1 Foundry.....	18.50@ 19.00	—4 mos.
" " No. 2 "	17.50@	—4 mos.
" " Stove..	16.50@	—4 mos.
" " Mill.....	17.00@	—4 mos.

CAR-WHEEL

H'n'g R., C. B. {Hecla, Jefferson, Buckhorn, Chesapeake.}	$30.00@ 35.00	—4 mos.
Maryland, "Cedar Point.....	33.00@	—4 mos
Missouri, "Maramec.....	28.00@ ...	—4 mos

BLOOMS.

Charcoal	$45.00@$50.00—cash.

SCRAP IRON.

Cast.....	40c. @ 45c.—cash
Wrought.....	62½c.@ $1.00—cash

Cleveland. Feb. 4. 1879.

[Specially reported by Messrs. C. E. BINGHAM & Co.]

No. 1 Red Specular	$6.00 per ton cash.		
No. 2 " "	5.00	"	"
Red Hematite	4.25	"	"
Lake Champlain ore	5.25	"	"

FOUNDRY IRON.

No. 1 L. S. Charcoal..	$22 00	Am. S., No. 1, Ch. Val..	$20.00
No. 2 " " ..	21 00	" " B—1, " " ..	18.00
No. 1 Anthracite.....	20 00	" " No. 2 " " ..	18.00
No. 2 "	19 00	No. 1, Massillon.....	19.00
No. 1 Bituminous.....	20 00	B—1, "	17.00
No. 2 "	18 00	No. 2, "	16.00

CAR-WHEEL AND MALLEABLE IRON.

No. 3, L. S. Charcoal.	$23 00	Nos. 5 & 6, L. S. Char.	$23 00
No 4, " " ..	23 00		

BESSEMER IRON.

Nos. 1 & 2, L. S. Char.....	$23.00

FORGE IRON.

No. 1, Gray.....	$18 00	White and Mottled....	$16 00

Columbus, O. Feb. 4, 1879.

[Specially reported by Messrs. KING, GILBERT & WARNER, Dealers in Pig Iron and Ores.]

There has been but very little change in the condition of the market since our last report. There was a very fair business done in January, but we look for a more active demand this month. We quote as follows:

FOUNDRY IRONS

No. 1 Hanging Rock Charcoal.....	$22.00@$22.50
No. 2 " " "	21.00@ 21.50
No. 1 Hocking Valley soft and strong from pure limestone ores.....	18.25@ 18.75
No. 2 Hocking Valley soft and strong from pure limestone ores.....	17.25@ 17.75
No. 1 American Scotch.....	18.00@ 18.50
No. 1 Moxahala.....	18.00@ 18.50
No. 2 "	17.00@ 17.50
No. 1 Shawnee.....	18.00@ 18.50
No. 1 Silver Gray.....	16.50@ 17.00
No. 2 " "	15.50@ 16.50

MILL IRONS.

Gray neutral.....	16.00@ 16.50
Mottled and white neutral.....	15.00@ 15.50
Gray cold short	15.50@ 16.00
Mottled and white cold short	14.50@ 15.00

Louisville. Feb. 4, 1879.

[Specially reported by Messrs. GEORGE H. HULL & Co.]

The demand is improving. Prices are firm, and we look for a further advance soon.

The usual time, four months, is allowed on quotations below:

FOUNDRY IRONS.

	No. 1.	No. 2.
Hanging Rock Charcoal...	$21 00@$22.00	$19.00@$20.00
Southern Charcoal.....	18.00@ 18.50	16.50@ 17.00
H'n'g Rock, Stc'l & Coke..	19.00@ 20.00	18.00@ 18.50
Southern Stonecoal & Coke	18.50@ 19.00	17.50@ 18.00

"Amer. Scotch"... $18@$19 | Silver Gray... $16@$17.00

MILL IRONS.

No. 1 Charcoal, Cold-short & Neutral.....	$16.50@$17.00
No. 1 Stc'l & Coke, Cold-short & Neutral....	16.50@ 17.00
No. 2 Stc'l & Coke, Cold-short & Neutral....	15.50@ 16.00
No. 1 Missouri and Indiana, Red-short.....	20.00@ 21.00
White & Mottled, Cold-short & Neutral.....	14.50@ 15.00

CAR-WHEEL AND MALLEABLE IRONS.

Hanging Rock, Cold Blast.....	$29.00@$33.00
Alabama and Georgia, Cold Blast	28.00@ 29.00
Kentucky, Cold Blast.....	25.00@ 30.00

Pittsburg. Feb. 4, 1879.

[Specially reported by A. H. CHILDS.]

	4 mos.		4 mos.
No. 1 F'dry..	$19.00@$20.00	M. & White...	$15.00@$16.00
No. 2 " ..	18.00@ 19.00	Hot Blast Ch.	20.00@ 23.00
Gray Forge..	16.50@ 19.00	Cold Blast W..	35.00@ 37.00

Richmond, Va. Feb. 3, 1879.

[Specially reported by ASA SNYDER, Esq.]

Sailing vessels from New York have been four weeks in reaching our wharves, because of the extraordinary ice-gorge in the James River, commencing a short distance below this harbor and reaching for nearly eight miles. This gorge was forced by the steamsr Wyanoke, of the Old Dominion Steamship Line, on her last trip out—four days ago. Our port is now open, and business has felt a vigorous impulse. Better demand for foundry grades of pig-iron. Old rails remain firm.

Amer. Scotch Pig Iron.....	$21.50@$22.50
Anthracite " " No. 1....	19.00@ 20.00
" " " No. 2.....	18.50@ 19.00
" " " No. 3.....	17.00@ 18.00
" " Mottled..	15.00@ 16.00
Coke " No. 1.....	19.00@ 20.00
" " No. 2	18.00@ 19.00
Va. Cold Blast Charcoal Pig Iron, cold short	19.00@ 22.00
" " " " " neutral.	27.00@ 28.00
" Warm " " " " cold short	18.00@ 20.00
" " " " " " mill.....	17 00@ 18 00
Old Rails.....	17.00@ 18.00
Wrought scrap No. 1.....	16.00@ 17.00
Cast scrap—Machinery.....	15.00@ 16.00
Richmond Refined Bar Iron.....	2.00@ 2.10
Horse-shoes.....	4.00@ .....
Mule-shoes.....	5.00@ . ..
Old Dominion nails (standard size).....	2.25 keg.

Freight by sail to New York, $1.60 for 2240 lbs.

St. Louis. Feb. 3, 1879

[Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.]

COLD BLAST CHARCOAL—ALL NUMBERS.

Hanging Rock.....	$23@$25	Assorted Bar Iron	$1.95 rates.
Tennessee.....	22@ 23	No. 1 Wr'ght Scrap,	90c. cwt.
Kentucky.....	22@ 23	Heavy cast "	65c. "
Missouri.....	22@ 23	Light " "	40c. "
Georgia.....	22@ 23	Old rails.....	$19.00@$21.00
Alabama	22@ 23	Old carwheels	17.00@ 18.00

	No. 1.	No. 2.	Mill.	White and Mottl'd
Missouri stone coal.....	$21.00	$20.00	$19.00	$17.00
" charcoal.....	20.00	19.00	18.00	.....
Tennessee charcoal.....	20.00	18.50	17.50	.....
Tenn. coke very soft and strong.....	20.00	19.00	17.00	16.00
Hanging Rock charcoal..	22.00	20.00	19.00	.....
" " cold short	23.00	21.00	20.00	.....
	ExNo.1	No. 1.	BNo.1.	No. 2.
Alice Hanging Rock coke.	$22.00	$21.00	$19.50	$19.00
Moxahala Black Band ores	21.00	20.00	19.50	18.00

METALS.

NEW YORK, Friday Evening, Feb. 7, 1879.

There has not been much business recorded during the week under review, yet there are inquiries and other indications of business that have created a very hopeful feeling in the trade. The whole list of prices is very strong, with an upward inclination to several articles.

RECEIPTS OF METALS AT NEW YORK FOR THE FOUR WEEKS ENDING FEBRUARY 6TH AND YEAR FROM JANUARY 1ST, 1879.

	Jan. 16	Jan. 23	Jan. 30	Feb. 6	Year from Jan. 1.
Copper, bbls.	72	167	296	201	832
Copper, boxes	.....	.....	.....	.....	.....
Copper, cakes	.....	129	1,009	115	1,362
Lead, pigs	4,921	2,515	2,712	6,945	19,244
Spelter, pieces	2,780	5,125	.....	2,867	12,496
Quicksilver, flasks	.....	.....	.....	.....	.....

Copper.—The business in this article has been very small at 15½c., which is the closing price. The manufacturers of sheathing have formed a combination on the basis of 22c.

From London, under date of Jan. 24th, we have received the following relative to copper:

"The market is inanimate, and, to effect sales, holders would find it necessary to make a fair concession on the current quotations. The only business reported to-day was a sale of 50 tons Chili Bars, of one of the best brands, at £57¼ cash; but for other marks, in the same category, the prices asked range from £57⅛@£58. What are usually classed under the head of 'favorite sorts' are quoted £57@£57¼, with buyers at £56¾@£57; while G. O. B's are offering at £56⅛@£56¾ without finding takers. Australian unaltered, and nothing doing, either in Burra or Wallaroo, pending the auctions."

Tin.—We only note sales of 500 slabs of Straits at 14¾c. There are, however, indications of considerable business within a few days, and the market closes at 14⅛@15c., with an upward tendency. The London price is £59 10s., while Singapore quotes $19.25. The arrivals during the week have been 3900 slabs. L. & F. is quoted at 14c., and refined is offered to arrive at 14¾@14¼c. The shipments of tin from the Straits to the United States in January were 500 tons, and to England, 1025 tons.

A London correspondent, under date of Jan. 24th, says:

"We did not hear of any transactions; values are still 59⅛@59¾s., with perhaps a little more disposition to entertain offers at the minimum rate. Here, also, business is checked by the impending sale of Banca, which is to take place in Holland on Tuesday next."

Tin Plates.—Included in the business done this week have been 2000 boxes of coke tins at $5.35@$5.37½, and 800 boxes of charcoal roofing on private terms. There is a good business doing, and the outlook is quite favorable. We quote charcoal, bright, ⅛ X, Melyn grade, at $6.37½, and Allaway grade, $6.10; charcoal ternes, Allaway grade, $5.50; coke, bright, B. V. grade, $5.37½, and coke roofing, 14×20, $5.12½.

Messrs. Robt. Crooks & Co., of Liverpool, under date of January 23d say:

"Tin and terne plates have been, during the past fortnight, so freely bought, that few makers have more to sell for delivery over next two months. Under these circumstances, quotations are really nominal. Advances actually paid have been 2s. 6d. per box above lowest for coke tins, 6d. to 1s. for all other sorts."

Lead.—The business has been confined to small sales of common, amounting to perhaps 100 tons, at 4⅛@4⅝c. About 150 tons of corroding lead have been sold in this market at 4·70@4·75c., while at St. Louis sales of 250 tons were made on the basis of 4·75c. delivered here. The market is very strong, and, should the business come that is expected, a further advance may be looked for.

Spelter and Zinc.—We note a sale of two carloads of spelter at 4⅝c. The asking price at the close, however, is 4¾c. Sheet zinc is quiet at 6¼@6½c. Bergen Port spelter, from Lehigh ores, is quoted at 9c.

Antimony.—There is but a small business doing at 11¾@11⅞c.

THE BULLION MARKET.

NEW YORK, Friday Evening, Feb. 7, 1879.

The market for the past week has been quiet and nominal until to-day, when the announcement was made that our government will suspend, for some time to come, their purchases of silver bullion for delivery at the Philadelphia mint for coinage into the standard dollar, and will buy weekly only limited amounts for the New Orleans and San Francisco mints. As under this policy of our government very considerable amounts will have to be sent abroad to find a market, it is more than likely that the London market will soon show lower figures. The closing price in London was 49 15/16d.; here, $1.08⅝, and in San Francisco 16 per cent discount.

DAILY RANGE OF SILVER IN LONDON AND NEW YORK, PER OZ.

DATE.	London Pence.	N. Y. Cents.	DATE.	London Pence.	N. Y. Cents.
Feb. 1	50	109	Feb. 5.	50	109
Feb. 3	50	109	Feb. 6.	49 15-16	108¾
Feb. 4	50	109	Feb. 7.	49 15-16	108⅝

Redemption of Trade Dollars.—WASHINGTON, January 31.—The House Committee on Coinage, Weights, and Measures yesterday agreed to report favorably Mr. Fort's bill, which provides "that the Secretary of the Treasury shall cause to be exchanged at the Treasury and at all sub-treasuries of the United States legal-tender silver dollars for trade dollars of 420 grains standard silver at par, and shall recoin the said trade dollar into legal-tender dollars of 412½ grains of standard silver, as now provided by law, and shall stop further coinage of trade dollars."

A Vote on the Silver Question.—WASHINGTON, February 3.—The House this afternoon defeated, by a vote of 101 yeas to 136 nays, a bill declaring gold and silver coins interchangeable at the lawful value when presented in sums of one hundred dollars and multiples thereof.

The Product of Clear Creek County, Colorado, for 1878.—We are indebted to the Georgetown *Miner*, of the 11th of January, for the following details of the ore products, values and purchases of the mills and smelting works of Clear Creek County during the past year:

Pelican Mill	$159,474.86
Silver Plume Concentrating Works	109,664.14
Washington Mill	191,111.86
Farwell Reduction Works	105,000.00
McCann & Co.	248,995.00
Clear Creek Co.	618,570.81
Mathews, Morris & Co.	430,555.06
Other buyers, figures given to be used in the general aggregate	447,154.34
Shipped direct out of the County to Hill and others	110,000.00
Gold; product of Empire and placers	126,000.00
Total production for 1878	$2,546,526.07

The details of McCann & Co.'s operations are given in the following, the statement including the business of the Georgetown mill and of the works at Lawson, the latter having been in operation about seven months. The value is calculated on a basis of $1.13 per oz.

Total weight of ores, 900 tons.
Average number of ounces of silver per ton, 235.
Value per ton, $265.55.
Total value, $248,995.
Two hundred tons of the above contained 35 per cent lead.

Mathews, Morris & Co. make the following statement of ores crushed and sampled at the Rocky Mountain Mill, in Georgetown, during the year 1878:

Gross weight of ore, 1746 tons, 409 lbs.
Silver contents in ounces, 372,024.9.
Gold contents in ounces, 58.4.
Lead contents in lbs., 257,112.37.
Average silver assay per ton, 234 oz.
Average price paid per ton, $195.55.
Average of lead in ores, 8 per cent.
Total coin value, $439,555.06.

The product is estimated on a basis of $1.13 for fine silver; $20 per oz. for gold: and 3½ cents for lead.

The Clear Creek Company publish the following: From the concentrating and sampling mill we have sent to the leach mill and other buyers in and out of Georgetown during the year. 7,868,510 lbs. of ore. Besides this we have concentrated.. 5,482,901 lbs.,

Making a total of ore handled for 1878 of ..... 13,351,411 lbs., 6,675 1411-2000 tons.

For this we paid in cash, $300,976.67, making average price per ton paid, $45.

To reach the "coin value" that is usually estimated, we take $1.13 as average coin value of one ounce silver for 1878. Referring next to the current price list for 1878, on the basis of $1.13, we find ore assaying 82 oz. per ton at 55 cts. per oz.—$45.10 per ton.

We have therefore bought 6675 1411-2000 tons of average assay 82 oz., or 547,407·8 oz. of silver.

These 547,407·8 ounces silver at $1.13 were worth $618,570.81, which is the "coin value" of our purchases for 1878.

During 1878 we have had no accidents to man or machinery in the mills of the company, but have run steadily, stopping only for usual repairs.

We have received and sampled ores every day during the past year except Sundays and Christmas.

We paid out in Georgetown for labor $42,013.88 and for fuel $9647.86.

We have shipped bullion worth $124,966.56.

The Salt Lake *Tribune* of February 1st says: "McCormick & Co. report receipts and sales of bullion and ores for the week ending the 1st inst., as follows:

14 cars bullion, valued at	$29,300
416 tons ores "	12,950
Total	$42,250

Campbell, Cullen & Co. have about half completed a contract to ship fifty car-loads of their bullion to the Pennsylvania lead works.

The Morgan smelter yesterday received from White & Shiloh, Battle Mountain, Nev., two lots of sulphides, one lot assaying $96.03 to the ton, and the other over $1100, and shipped a car-load of bullion, amounting to $6000.

Water was turned into the canal of the Old Telegraph works a few days since, but it again broke over the bank and caused a further delay. The break, however, was small and was soon repaired, so that the smelter will be started up to-day, and the production of bullion recommenced.

The Chicago smelter, at Rush Lake, Tooele County, which has been so long idle, will be started up to-day by Messrs. Brooks & Davis.

The Pennsylvania Lead Company is operating its works at Mansfield to full capacity. On one day recently it shipped about $6600 worth of silver to New York.

Purchase of Silver Bullion.—WASHINGTON, February 5.—The Treasury Department to-day purchased 300,000 ounces of silver, mostly for delivery at San Francisco. Over 600,000 ounces were offered.

Production of the Leading Mines for 1878.—The following table, taken from the *San Francisco Bulletin*, shows the product of those mines consenting to furnishing statements of their output, and in the main they are accurate and nearly complete:

Alps	$51,700
Alexander	112,700
Black Bear	155,000
Bechtel	46,000
Bodie	1,180,000
Belmont	37,000
California	10,949,100
Consolidated Virginia	7,905,100
Chollar-Potosi	48,800
Crown Point	35,600
Comanche	171,100
Christy (Utah)	302,500
Consolidated Amador	90,000
Caledonia (Dakota)	13,800
Conley & Gowell	33,200
Day	55,900
Deadwood	117,500
Eagle (one month)	7,900
Empire (Nevada County)	104,600
Empire (Sierra County)	20,600
Endowment	60,600
Eureka Consolidated	5,491,900
Excelsior Water and Gravel	300,500
Extra	82,100
Father De Smet (Dakota)	92,200
Grand Prize	641,100
Gila	33,900
Golden Terra	50,900
Gold Stripe	66,100
Green Mountain	47,100
Giant and Old Abe	16,600
Highland	13,100
Hussey Consolidated	88,000
Hackberry	161,200
Homestake	267,000
Hillside	18,800
Hamburg	65,000
Idaho	604,900
Independence	345,800
Indian Queen	99,000
Justice	253,800
K K Consolidated	227,500
Keystone Quartz (partly estimated)	200,000
Klamath (partly estimated)	60,000
Leopard	154,100
Leeds	260,000
Lincoln (estimated)	100,000
La Grange Hydraulic	85,500
Manhattan	1,121,200
Martin White (also $40,000 copper matte)	204,400
McCrackin Consolidated	336,000
McMillan	100,000
Modoc Consolidated (partly estimated)	360,000
Milton Water and Gravel	537,800
Murchie	10,600
North Bloomfield Gravel	311,300
Northern Belle	614,400
Navajo	77,200
New Coso Consolidated	75,400
New York Hill (partly estimated)	40,000
Ontario	1,455,100
Ophir	91,400
Original Amador	78,600
Oriental Consolidated	26,300
Plumas Eureka	451,200
Pittsburg	7,400
Raymond & Ely	259,700
Rye Patch Consolidated	78,900
Standard	1,014,000
Star	392,300
Silver King	602,600
Sierra Buttes	312,300
Silver Prize	7,600
Tybo Consolidated	779,400
Tip Top	302,100
Trojan	78,700
Total	$41,100,100

"The foregoing list embraces 76 mines. Most of these are either in California or Nevada, though there are half a dozen from Dakota (all gold claims), five from Arizona, and three from Utah (all silver claims). The record of the Wells Fargo Express Company gave the yield of the Pacific States and Territories for 1878 at $78,276,000. We can trace over half that amount to 76 mines, as shown in the above statement, but there are no Oregon, Washington, Idaho, Montana, Colorado, or New Mexico mines in the list. These, according to Mr. Valentine, produced $13,615,000 of the $78,000,000 reported by him."

In addition to the above we append the following, showing the production of various mines not reported in the list given, taken from the *Commercial Herald* of Jan. 30*th*, 1879:

Product of California Mines—Hydraulic, Nevada County,	
Eureka Lake and Yuba Canal	$320,000
Blue Banks	125,000
Other Mines on the San Juan Ridge	500,000
Blue Tent	92,000
Nevada	100,000
Little York, H. M. Co.	125,000
The Quaker Hill, Birdseye Creek, and other Companies operating on the ridge between the South Yuba and Bear River	500,000
Hite Gold Mining Co. (quartz) Mariposa County	250,000
Placer County.	
Mines about Dutch Flat and Gold Run	$700,000
Mines on the Forest Hill Divide	350,000
Sierra County.	
Brandy City	$46,000
Morgan Claims	63,000
Poverty Hill	25,000
Mines at Gardner's Point, Scales Diggings and elsewhere in the county	500,000
Yuba County.	
Excelsior W. and G.	$300,000
Other mines about Smartsville	200,900
South Feather River and other mines in the county	150,000
Butte County.	
Spring Valley Co., at Cherokee	$253,550
Other companies in Buttee	150,000
Plumas County.	
Saw-Pit Flat	$27,000
Other mines in the county	100,000

Shasta County.

Dry Creek T. & F. Co.	$60,000
Other mines in the county	30,000

The product by counties may be credited on account of yield from their hydraulic mines, as under: Trinity, $1,500,000; Siskiyou, $1,000,000; El Dorado, $500,000; Amador, $300,000; Calaveras, $100,000; Tuolumne, $150,000; the La Grange in this county having produced $85,600.

DRIFT MINES.

This class of mining is mostly confined to California, where there are a great number of parties operating by this method on a small scale, and who take out annually all the way from one or two thousand to forty or fifty thousand dollars each. The following comprises most of the larger companies in the State, with their product for the past year:

Bald Mountain, Sierra County	$400,000
Enterprise, Sierra County	200,000
North America, Sierra County	180,000
Buckeye, Plumas County	160,000
Damascus Co., Placer County	175,000
Arizona	
Signal	100,000
Mineral Park	150,000
Peck	300,000
Aztlan	30,000
Silver King	600,000
McMillan	100,000
Nevada.	
Mines in Ely District not reported above	$200,000
Tuscarora District	1,227,853
Richmond Con., Eureka County	3,500,000
Warban	100,000

BULLION SHIPMENTS.

We give below a statement showing the latest bullion shipments in addition to those announced in our issue of February 1st:

January	23d	Tybo Con	Nev.	$7,474.40
"	22d	Trojan	"	6,860.48
"	22d	Northern Belle	"	2,631.69
"	24th	Paradise Valley	"	6,649.78
"	24th	Ophir	"	24,036.96
"	25th	California	"	101,797.54
"	25th	Con. Virginia	"	17,793.53
"	27th	Alexander	"	13,163.00
"	27th	Grand Prize	"	21,000.00
"	25th	Martin White	"	10,525.00
"	22d	Bodie	Cal	11,414.37
"	23d	Standard	"	17,985.53
"	30th	Silver Reef	Utah.	18,566.27
"	28th	Leeds	"	3,322.00

Following is the bullion yield of the Comstock for December, 1878:

	Gold.	Silver.
California	$425,100	$421,500
Consolidated Virginia	41,900	43,000
Justice	3,900	5,000
Ophir	30,700	39,200
Trojan	9,100	9,100
Totals	$510,700	$517,800

The Great Eastern Mine, Black Hills, made a clean-up recently of over $2000, the ore yielding $11 per ton.

The Hidden Treasure Mine, near Central Colorado, turned out 267 ounces of gold the week ending January 25th.

Coin Assets of the United States February 1, 1879:

Gold coin and bullion	$133,756,906.65
Standard silver dollars	17,874,457.00
Silver coin and bullion	16,491,338.63
Gold certificates	544,020.00
Silver certificates	2,170,840.00
National bank gold notes	80,425.00

U. S. Assay Office Business for January, 1879, is given in the following:

A statement of business at the United States Assay Office at New York for the month ending January 31st, 1879.

Deposits of gold		$808,000.00
Deposits of silver: miscellaneous	$67,000	
U. S. bullion, Colorado	305,000	
U. S. bullion, Lake Superior	40,000	
U. S. bullion, Montana	38,000	
U. S. bullion, New Mexico	7,500	
U. S. bullion, Utah	43,500	
		501,000.00
Total deposits		$1,369,000.00
Gold bars stamped	$595,251.13	
Silver bars stamped	692,058.52	
		1,287,309.65
Transmitted to mint of the U. S. at Philadelphia, for coinage, gold		803,477.90

Pacific Coast Mints.—Washington, January 27.—The House Committee on Appropriations have agreed to recommend appropriations for expenditure at the San Francisco Mint during the next fiscal year as follows: For salaries, $24,900; wages of workmen and adjusters, $275,000; material and incidental expenses, $87,500. The appropriations for the Carson Mint will be the same as last year for salaries, together with $80,000 for wages and $42,500 for material and incidental expenses. The committee will insert in the bill a provision on the subject of melting and refining bullion identical with that contained in the Appropriation Act of last year. The committee will, however, recommend repeal of the authority then given for issuance of coin certificates by the mints, as it involves considerable expenditure by the government for transportation, which they wish to save.

FINANCIAL.

New York Stocks.

New York, Friday Evening, Feb. 7, 1879.

The past week has witnessed a variable market in the coal stocks, with a considerable lessening in the volume of the transactions as compared with our last. In the stock of the Delaware & Hudson Canal Company the sales reach over 11,000 shares, at prices ranging from 38⅛ to 42, closing at 40⅝. Delaware, Lackawanna & Western RR. stock has changed hands to the amount of 140,555 shares, at from 49⅞ to 52¾, closing at 51⅝. New Jersey Central has materially advanced, closing at 42¾, against 41⅛ a week ago. The sales amount to about 48,000 shares.

At the annual meeting of the Maryland Coal Company, in this city, on the 4th inst., no change was made in the officers, and the old Board of Trustees was continued.

Auction Sales:

Union Petroleum Co.—500 shares, at $1.25 per share.
Bartlett Zinc Co.—$1000 shares, $4 for lot.
Cumberland Coal and Iron Co.—10 shares, $10 for lot.
Consolidation Coal Co.—100 shares, at $18¼ per share.
Straitsville Cannel Coal and Iron Co.—$3000 of the 1st mortgage 7 per cent. bonds, at $24 per bond.
Bethlehem Iron Co.—$9000 of the 1st mortgage 6 per cent bonds, at 90 per cent.

Miscellaneous Stocks and Quotations.

Sales and quotations of the stocks and bonds dealt in here, at Philadelphia and Baltimore, for the week ending the 6th ult. are given in the following tables. The Philadelphia quotations will have a * affixed. The Baltimore quotations are indicated thus †.

Stocks.	Par Value.	High'st	Lowest	Closing	Sales: Shares.
American Coal Co.	$25	. . .	.....	30	.....
St. L., I. M. & S. R. Co.	100	16	14⅜	16¼	1,190
Spring Mt. Coal Co.	50	.....	.....	50	.....
*Cambria Iron Co.	50	.....	.....	62	.....
*Penn. Salt Mf'g Co.	50	.....	.....	72	.....
*Westm'land C. Co.	50	.....	.....	50	.....
*Buck Mt. Coal Co.	50	.....	.....	35	.....
*Schuyl. Nav. Co.	50	.....	.....	.....	.....
†B. & O. RR. Co. 1st pf	.....	101	.....	101	167
†B. & O. RR. Co. 2d pf	100	94½	94	90	15
" " " " com	90	93	92½	92	72
†George's C'k C. Co	100	.....	.....	50	.....
†S. Clara M'g Co.	100	.....	.....	25	.....
†Atlantic Coal Co.	10	.....	.....	90	.....

Bonds.	Princ'l. When Due.	Int'est. When Due.	Hig'st.	Lowest	Amount.
D., L. & W., 7s, conv	1892	J. & D.	107½	.....	$8,000
" " " " 2d mtge.	1881	M. & S.	106⅞	106¾	3,000
N. J. C., 1st mtge. new	1890	F. & A.	116	115	20,000
" " " 1st mtge., con	1899	Q.	82½	80⅝	*570,000
" " " convt.	1902	M. & N.	81¾	80¾	*12,000
Lehigh & W. B., con	1899	Q.	47¼	46	*33,000
Am. Dock & Imp. 7s	.....	J. & J.	59	.....	†22,000
St. L. I. M. & S. 1st mt	1892	F. & A.	110¼	110	19,000
Ches. & O., 1st mtge	1899	M. & N.	.....	.....	.....
D & H C Co., 1st m. rg	1884	J. & J.	98¾	98¼	9,000
" " " " " "	1891	J. & J.	98½	98¼	10,000
" " " " m. loan cp	1894	A. & O.	102	.....	10,300
" " " " " rg.	1894	A. & O.	102	.....	15,000
" " " " new mge.	.....	.....	.....	.....	.....
*L. V. R., 1st m. 6s. cp.	1898	J. & D.	.....	111	.....
" " " rg.	1898	J. & D.	113	.....	1,000
" " " 2d m. 7s, rg.	1910	M. & S.	120	.....	7,000
" " " con. m. 6s, rg	1823	J. & D.	102	101¾	16,000
" " " " 6s cp.	1923	J. & D.	102	101¾	13,000
*Pa. RR., 1st m. 6s, cp	1880	J. & J.	104	.....	4,000
" " g. m., 6s, cp.	1910	J. & J.	.....	.....	.....
" " " 6s, rg.	1910	A. & O.	.....	.....	.....
" " con. m. 6s, rg.	1905	Q.	.....	102½	.....
" " " 6s, cp.	1905	J. & D.	102¾	.....	8,000
" " new loan, 6s	.....	.....	112⅜	112	7,100
*P. & R. R., 1st m. 6s, R. C. 43-44	1880	J. & J.	.....	.....	.....
P. & R. R., 1st m. 6s, R. C. 48-49	1880	J. & J	.....	.....	.....
P. & R. R., 2d m. 7s cp	1893	A. & O.	.....	114	.....
" " " scrip	1882	J. & J.	50	49	1,580
" " " in. m. 7s, cp	1896	J. & D.	.....	.....	.....
" " " c. m. 7s, cp.	1911	J. & D.	105	103	25,000
" " " 7s. rg.	1911	J. & D.	105½	.....	5,000
" " " cvt. 7s, R. C	1893	J. & J.	‡26	.....	20,000
" " C. & I. Co., Deb 7s, R. C.	1892	M. & S.	.....	.....	.....
& R. C. & I. Co., m. 7s, R. C.	'92-3	various	.....	.....	.....
*L. Nav. Co., 6s, rg. m.	1884	J. & J.	106½	.....	2,100
" " RR., rg. m.	1897	F. & A.	106	.....	200
" " cvt. co. G. R.	1894	M. & S.	96	.....	500
" " " Gold R. C.	1897	J. & D.	95½	95¼	14,500
" " con. m. 7s, rg.	1911	J. & D.	.....	.....	.....
*P. & N. Y. C., 7s, R. C.	1896 / 1906	J. & D.	117⅞	117½	14,000
*Pa Canal, 6s, cp..	1910	J. & J.	71	70	11,000
*Schuyl. Nav., 1st m. 6s. rg	1897	M. & S.	.....	84¼	.....
*Sus. Coal, 6s, rg.	1911	J. & J.	90½	.....	2,000
†Balt. & O. RR., 6s..	1880	J. & J.	101⅛	.....	5,500
" " " " 6s..	1885	A. & O.	.....	106	.....

Total transactions for the week..... $488,480

* Assented. † $7000 assented, selling at from 61@69.
‡ Ex-coup.

Philadelphia Stocks.

Philadelphia, Friday Evening, Feb. 7, 1879.

The Philadelphia market is remarkably steady, and operations are very much restricted, the total sales for the week amounting to only about 78,000 shares, of which Pennsylvania stock contributes 67,323 shares, at from 34⅝ to 35⅜, closing at 34⅛. Reading has sold to the extent of 10,000 shares at nearly 12⅛ all the week.

Huntingdon & Broad Top Mountain RR. & Coal Co. Annual Report.—The stockholders of this company held their annual meeting on the 4th inst. The twenty-sixth annual report showed the following:

Receipts from all sources, $240,041.47; expenses of roadway, $125,032.50; net earnings, $115,008.97. This was expended as follows: Interest on first and second mortgage loans, $55,020; premiums on gold, $249.72; account of new road up Sandy Run, $6563.30; interest on scrip, $8723.25; interest on floating debt, $10,859.03; construction and equipment, $1430.09; in reduction of floating debt (about), $32,163.58; total, $115,008.97. The number of passengers carried in 1877 was 47,363, and 43,618 in 1878. The number of tons of freight moved in 1878 was 394,788; of which 150,224 tons were Broad Top coal, and 163,594 tons Cumberland coal. The whole tonnage being 6472 tons more than in 1877; and the net earnings being $7096.82 less than in 1877.

Delaware Division Canal Co.—Annual Report.—The annual meeting of this company was held on the 4th inst. After the adoption of the annual report of the Board of Management, the terms of the modification of the lease between the Delaware Division Canal Company and the Lehigh Coal and Navigation Company were presented and unanimously adopted. The modification is to the effect that so much of the rent payable under the said lease as is applicable to pay dividends of the Delaware Division Canal Company is to be reduced to sums sufficient to pay 4 per cent per annum of dividends on the par of the present capital stock of the Delaware Division Canal Company, instead of 8 per cent, and the holders of shares of stock of the Delaware Division Canal Company may, at their option, at any time hereafter transfer the same to the Lehigh Coal and Navigation Company; and the Lehigh Coal and Navigation Company will thereupon issue to said holders, in exchange for said shares thus transferred, an equal number of shares of the capital stock of the Lehigh Coal and Navigation Company; provided, that at any time after three quarters of the shares of the capital stock of the Delaware Division Canal Company shall have been thus exchanged, the Lehigh Coal and Navigation Company may, at their option, terminate this right to exchange shares upon giving twelve months' notice of their intention so to do in writing, etc.; and the agreement made by the Delaware Division Canal Company for the extension of the time for the payment of the principal sum of their bond indebtedness of $800,000 for twenty years from the 1st day of July, 1878, is hereby sanctioned.

ANNUAL MEETINGS.

Youghiogheny Coal Hollow Coal Co.	Feb. 12
Crane Iron Co.	" 12
Glamorgan Iron Co.	" 18
Consolidation Coal Co.	" 19
Delaware, Lackawanna & Western RR. Co.	" 25

A meeting of the stockholders of the West Fairmount and Marion Consolidated Gas-Coal Co. will be held February 10th.

Gas Stocks.

New York, Friday Evening, Feb. 7, 1879.

The market keeps on the same steady rise, without any prospect of settling down. A comparison of today's list with that of two weeks ago will show the course of the market.

A New Gas.—A company from New York proposes to organize a new gas company in New Britain. They have already organized a company for the same purpose in Waterbury. The gas is manufactured from oil, is said to burn without any odor, and it is claimed that it can be furnished for two fifths the cost of coal-gas.

The price of gas in Easthampton, Mass., has been reduced from $4 to $3.50 per thousand feet.

Lighting the Streets of Brooklyn.—The following proposals for lighting the streets of Brooklyn were publicly opened Jan. 24th:

	Per lamp per annum.
Metropolitan Gas-Light Co.	$27.00
Brooklyn Gas-Light Co.	25.00
People's Gas-Light Co.	27.00
Citizens' Gas-Light Co.	27.00
Nassau Gas-Light Co.	27.00
Williamsburg Gas-Light Co.	26.00
Dio De Kremen	19.60
N. Y. and N. J. Gas-Light Co.	26.00
Automatic Gas-Lamp and Lighting Co.	19.85

The Syracuse Gas Co.—In its communication to the Common Council on the 4th inst., this company uses certain figures to show that the streets and public buildings of Syracuse are supplied at a much cheaper rate than are those of the following cities:

	Lamps.	Per year.	Total.
Rochester	2,344	$27.00	$63,288
Buffalo	4,628	26.00	120,328
Troy	639	31.87	20,363
Albany	1,196	35.00	41,860
Syracuse	1,082	14.00	15,148

In the paragraph which follows these figures the reason

COAL STOCKS.

Name of Company.	Capital Stock.	Shares. No.	Par Val.	Last Dividend. Mo.	Y.	A't.	Rate per Ann.	Quotations of New York stocks are based on the equivalent of $100. Philadelphia prices are quoted, so much per share. Feb. 1. H.	L.	Feb. 3. H.	L.	Feb. 4. H.	L.	Feb. 5. H.	L.	Feb. 6. H.	L.	Feb. 7. H.	L.	Sales.
	$		$				Per c'nt													
Consol. Coal.	10,250,000	102,500	100	Jan.	77	2½	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Del. & H. C.	20,000,000	200,000	100	Aug	76	4	9	.....	.....	41½	39⅝	40½	39	39¾	39¼	40½	38⅞	42	40⅜	11,458
D., L. & W. RR.	26,200,000	524,000	50	July	76	2½	5	52	50¼	51⅝	50	50⅝	49⅛	50¾	49⅞	51¼	50	52¾	51⅜	140,555
Lehigh C. & N.	1,...8,250	208,971	50	Nov	76	1½	5½	15¼	15¼	.....	.....	15⅝	15⅜	15¾	15⅝	.....	.....	15⅝	15¼	874
Leh. V'y R. R	27,228,855	540,858	50	Dec	78	1	4	35⅛	35⅛	35⅛	35¼	35¼	35⅛	35⅛	35⅛	35⅛	35¼	35¼	35⅛	1,427
Mary'd Coal	4,400,000	44,000	100	Jan.	76	1½	1½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
N. J. C. R. R.	20,600,000	206,000	100	Apr	76	2½	2½	44	42	42¾	41½	42¾	40⅞	42¼	41	42⅜	41½	42⅞	42⅝	47,912
Penn. Coal...	5,000,000	100,000	50	May	78	3	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	132	.....	100
Penn. R. R...	68,870,200	1,337,404	50	Nov	78	2	8	35⅜	34⅞	35⅜	35¼	35⅜	35	35⅜	34⅞	35	34¼	35	34⅞	67,323
Ph. & R. R. R	34,278,175	685,563	50	Jan	76	42¼	10	12⅛	12⅜	12⅛	12¼	12⅛	12¼	12⅜	12⅛	12⅛	12¼	12⅜	12⅛	9,794

The Delaware and Hudson Canal Co. has paid in dividends to date $38,821,104, and the Philadelphia and Reading $43,012,407
Total Sales..... 279,443

GENERAL MINING STOCKS.

Dividend Paying Mines.

NAME AND LOCATION OF COMPANY.		Feet on Vein.	Capital Stock.	SHARES. No.	SHARES. Par Val	ASSESSMENTS. Total levied to date.	ASSESSMENTS. Date and amount per share of last.	DIVIDENDS. Total paid to date.	DIVIDENDS. Last Dividend.	Rate p. An	HIGHEST AND LOWEST PRICES PER SHARE IN CURRENCY AT WHICH SALES WERE MADE. Feb. 1. H.	Feb. 1. L.	Feb. 3. H.	Feb. 3. L.	Feb. 4. H.	Feb. 4. L.	Feb. 5. H.	Feb. 5. L.	Feb. 6. H.	Feb. 6. L.	Feb. 7. H.	Feb. 7. L.	SALES.
Alps	Nev.	800		30,000		204,000	Aug. 1878 $1 00	37,500	Apr. 1876	$0 05												
Belcher, G. S.	Nev.	1,040	10,400,000	104,000	100	1,392,200	Oct.. 1878 1 00	15,397,200	Apr. 1876	1 00					6							20
Bobtail, G.	Col.	2,500	1,136,630	227,326	5	*		56,831	Nov. 1877	25												
Bobtail Tunnel, G.	Col.		100,000	20,000	5	52,000	July 1873 0 30	48,000	June 1878	50												
Bodie, G.	Cal.		5,000,000	50,000	100	25,000	Feb. 1878 0 50	750,000	Dec. 1878	1 00			8									70
California, G. S.	Nev.	600	54,000,000	540,000	100			29,700,000	Dec. 1878	1 00	9⅞		10		9¾	9⅝	8¾		8	7½	8¼	8⅛	490
Calumet & Hecla, C.	Mch		2,000,000	80,000	25	1,200,000		13,850,000	Feb.. 1879	5 00			173¾	173	173				173½				66
Central, C.	Mch		500,000	20,000	25	100,000	June 1862 0 65	1,260,000	Feb. 1877	5 00												
Chollar Potosi, G. S.	Nev.	1,400	2,800,000	28,000	100	1,750,000	Sept. 1878 5 00	3,040,000	Feb. 1872	1 00												
Copper Falls, C.	Mch		1,000,000	20,000	50	535,000	May. 1876	100,000	Nov. 1871	1 00					1							100
Cons. Virginia, G. S.	Nev.	710	54,000,000	540,000	100	474,600	June 1873 3 00	40,500,000	June 1878	1 00			8¼	8			8⅛	7⅞	7⅞	7⅞	7⅞	7⅞	910
Confidence, G. S.	Nev.	130	2,496,000	24,960	100	256,320	Apr. 1878 0 50	78,000	May. 1865	8½													
Cons. Her. & Roe	Col.	16,500	1,000,000	100,000	10	*																	
Crown Point, G. S.	Nev.	600	10,000,000	100,000	100	1,973,370	Dec.. 1878 1 00	11,588,000	Jan.. 1875	2 00													
Daney	Nev.	2,000		108,000		91,800	Nov. 1878 0 20	56,000	July 1863														
Eureka Cons., G. S. L.	Nev.		5,000,000	50,000	100	100,000	May. 1876 1 00	3,400,000	Dec. 1878	3 00									39		31½		60
Eureka G. Mg., G.	Cal.	1,680	2,000,000	20,000	100			2,149,000	Apr. 1878	0 25													
Findley, G.	Geo.		200,000	200,000	1			30,000	Jan . 1879	10			51c		52c	50c	55c	52c	57c	54c	55c	54c	18000
Franklin, C.	Mch		500,000	20,000	25	360,000	June 1876 5 00	585,000	Nov. 1871	1 00													
Gila	Ariz			100,000		50,000	Aug. 1878 0 25	50,000	Aug. 1875	0 25													
Gould &Curry, G. S.	Nev.	612	10,800,000	108,000	100	2,828,000	Nov. 1878 1 50	3,826,800	Oct. 1870	10 00											5	4.65	35
Grand Prize	Nev.	1,500		100,000		100,000	July. 1878 1 00	400,000	Feb. 1878	1 00													
Hale & Norcross, G. S.	Nev.	400	11,200,000	112,000	100	2,970,000	Dec. 1878 0 50	1,598,000	Apr. 1871	5 00													
Homestake, G.	Dak		10,000,000	100,000	100						25⅝	25	25½	25	25	24½	24¾	24⅛	25	24⅞	25½	25⅛	1,285
Hukill, G. S.	Col.	3,288	1,000,000	100,000	10	*			Dec. 1878	0 10			5										200
Independence	Nev.	1,500		100,000		75,000	Feb.. 1878 15	150,000	Nov. 1878	25	1.60				1.65				1.65		1.65		880
Kentuck, G. S.	Nev.	95	3,000,000	30,000	100	300,000	Aug. 1878 1 00	1,252,000	Mar. 1870	5 00													
K. K. Cons.	Nev.			50,000		30,000	Jan.. 1879 1 00	50,000	Sept. 1873	0 25													
Leeds	Uth.	3,000		60,000				78,000	Oct.. 1878	0 15													
Leopard, L. G. S.	Nev.	1,500	5,000,000	50,000	100	200,000	Jan.. 1879 50	162,500	Dec. 1876	0 50													
Manhattan	Nev.			50,000		50,000	Oct.. 1878 1 00	400,000	Feb. 1877	1 00													
Merrimac, S.	Mas.	1,500	500,000	100,000	5	*	June	120,000	Mar.														
Minesota, C.	Mch.		1,000,000	20,000	50	436,000	1869 1 00	1,820,000	Mar. 1876	0 50													
Modoc	Cal.	4,000		100,000		400,000	Nov. 1878 0 50	50,000	Dec. 1876	0 50													
Moose	Col.	39,000	2,000,000	200,000	10	*		550,000	Mar. 1878	0 25	4.10						4.10	3.95	3.90	3.80	3.70	3.65	1,700
National, C.	Mch.		500,000	20,000	25	195,000	Oct.. 1875 1 00	360,000	Oct. 1873	1 00													
N. Y. & Colorado, G.	Col.		1,000,000	50,000	20	*		20,000	Mar. 1877	0 20	1.40				1.30		1.50	1.35	1.50	1.45	1½		1.50
Northern Belle, S.	Nev.	1,600	5,000,000	50,000	100			1,425,000	Feb. 1878	1 00													
Ontario.	Uth.	3,000	10,000,000	100,000	100			1,950,000	Jan. 1879	50			39¾	39					39¾	39⅜	39½	39⅜	415
Ophir, G. S.	Nev.	675	10,080,000	100,800	100	3,436,800	Nov. 1878 1 00	1,394,400	Mar. 1864	4 00													
Pewabic, C.	Mch.		500,000	20,000	25	185,000	June 1868 3 00	460,000	July 1873	1 00					75c								37
Phœnix, C.	Mch.		1,000,000	20,000	50	817,500	Sept. 1870 3 00	10,000	Dec. 1876	1 00													
Plumas	Cal.		1,000,000	100,000	10			110,000	Jan. 1879	10	3.40		3.40						3.40		3.35	3.05	1,100
Quincy, C.	Mch.		200,000	20,000	10			2,230,000	Feb. 1878	5 00			10½										35
Raymond & Ely, G. S.	Nev.	5,000	3,000,000	30,000	100	730,000	Jan.. 1879 1 00	3,075,000	Sept. 1873	3 00													
Ridge, C.	Mch.		500,000	20,000	25	200,000		90,000	Feb. 1875	1 00													
Rye Patch	Nev.	1,600		30,000		157,500	Dec.. 1878 1 00	105,000	Dec. 1877	0 25													
St. Joseph, L.	Mo.	2,000 acs.	1,000,000	100,000	10			250,000															
Savage, G. S.	Nev.	800	11,200,000	112,000	100	1,084,500	Dec. 1878 1 00	4,460,000	June 1869	3 00													
Seaton, G. S.	Col.	1,700	500,000	50,000	10	*			May 1877	0 10													
Sierra Nevada, G. S.	Nev.	3,650	10,000,000	100,000	100	2,350,000	Oct.. 1878 3 00	102,000	Jan. 1871	1 00													
Silver Islet	Mch										40¼				40⅛		40⅛	40					136
Silver King	Ariz							450,000	Nov. 1878	0 50													
Standard	Cal.			50,000		50,000	July 1878 1 00	800,000	Dec . 1878	1 00													
Yellow Jacket, G. S.	Nev.	1,200	12,000,000	120,000	100	3,798,000	Sept. 1878 1 00	2,184,000	Aug. 1871	2 50													
McClinton	Cal..	1,000		60,000		45,000	Dec.. 1878 0 25																

Non-Dividend Mines.

Allouez, C.	Mch.		1,000,000	20,000	50	940,000	May	1876	5 00															
Alpha, G. S.	Nev.	306	3,000,000	30,000	100	240,000	Mar.	1878	1 00															
Alta	Nev.	600		108,000		993,000	Dec.	1878	1 00															
Am. Flag, G.	Col.	5,300	600,000	60,000	10	*					21c								19c				600	
Andes	Nev.	2,000		100,000		355,000	Oct	1878	0 25															
Baltimore Cons.	Nev.	1,950		84,000		1,015,000	Apr.	1878	0 50															
Benton	Nev.	600		108,000		91,800	Dec.	1878	0 50															
Bechtel	Cal.			60,000		75,000	Nov.	1878	0 25															
Bertha & Edith. G.	Vir.	645 acs.	500,000	500,000	10	*					13c	12c	12c	11c	12c	11c	11c	10c	12c	10c	14c	11c	113,600	
Best & Belcher, G. S.	Nev.	545	10,080,000	100,800	100	538,590	Jan..	1879	1 00															
Boyle	Nev.	600		108,000		16,240	Aug.	1878	0 15															
Buckeye	Col.		2,000,000	400,000	5	*					25c	22c	24c	21c	22c	20c	22c	20c	23c	21c	25c	23c	67,600	
Bullion, G. S.	Nev.	943⅛	10,000,000	100,000	100	3,002,000	Dec.	1878	1 00															
Caledonia, G. S.	Nev.	2,188	10,000,000	100,000	100	1,540,000	Nov.	1878	0 50															
Cashier	Col.		500,000	250,000	2	*																		
Challenge	Nev.	90		50,000		10,000	Nov.	1878	0 20															
Cleveland, G	Col.	3,715	250,000	25,000	10	*																		
Cons. Imperial, G. S.	Nev.	468	50,000,000	500,000	100	775,000	Sept.	1878	0 20		1.10		1.25	1.20										
Con. N. Slope & E. T.C.	Col.	15,000	500,000	10,000	50																			
Dahlonega	Ga.		250,000	250,000	1						16c		15c		15c		16c	15c	15c				400	
Dana, C.	Mch.		500,000	20,000	25	68,000	Jan..	1863	0 50														6,300	
Dawson, S.	Ont.		1,200,000	60,000	20			1878																
Day	Nev.	1,500		100,000		55,000	Sept.	1878	0 25															
Dayton	Nev.	1,600		100,000		750,000	Apr.	1878	0 25															
De Frees	Ariz	1,500		100,000		115,000	Oct..	1878	15															
Duncan, S.	Ont.		1,200,000	60,000	20	75,000	July	1876	41⅔						3¾	3⅞	3	2½					1,700	
Exchequer, G. S.	Nev.	400	10,000,000	100,000	100	380,000	Jan..	1878	1 00															
Gold Placer, G.	Col.		5,000,000	200,000	25						22c	18c	25c	20c	21c	19c	20c	19c	20c	19c	17c		32,950	
Granville, G.	N. C.	357 acs.	1,000,000	100,000	10	*			0 50															
Humboldt, C.	Mch.		500,000	20,000	25	100,000	Sept	1878	0 15															
Hussey	Nev.	1,500		100,000		95,000	Oct..	1878	0 25		14c	13c	14c		14c				13c				1,200	
International, S.	Ont.		1,200,000	60,000	20								45c										10	
Julia, G. S.	Nev.	3,000	11,000,000	110,000	100	745,000	Nov.	1878	1 00															
Justice, G. S.	Nev.	2,100	10,500,000	105,000	100	2,763,500	Jan..	1879	1 00															
King's Mountain, G.	N. C.		1,200,000	120,000	10	*													1.40				100	
Kossuth	Nev.	2,700		108,000		421,200	Aug.	1877	0 15															
Lacrosse	Col.	3,900	1,000,000	100,000	10	*					28c		28c	27c	28c		29c	28c	29c	27c	28c		8,700	
Leviathan	Nev.	2,000		100,000		240,000	May.	1878	05										65c		70c		1,105	
Luzerne	Col.	4,200	5,000,000	500,000	10	*																		
Madison, C.	Mch.		500,000	20,000	25	123,000	Sept	1876	0 10															
Mariposa preferred	Cal.	44,387	5,000,000	50,000	100	1,425,000	June	1877	1 00															
" common	Cal.	acres.	10,000,000	100,000	100	1,425,000	June	1878	1 00												1¼	75c	300	
McCracken	Ariz	4,500		100,000		100,000	Oct	1878	0 50															
Martin White	Nev.			100,000		650,000	Dec.	1878	1 50															
Mesnard, C.	Mch.		500,000	20,000	25	160,000	Apr.	1876	0 50															
Mexican, G. S.	Nev.	600	10,080,000	100,800	100	217,400	May.	1878	0 50															
Minnietta Belle	Cal.	1,500		100,000		75,000	Apr.	1878	0 50															
Mt. Bross Tunnel	Col.	8,600	2,000,000	200,000	10	*		1878																
Navajo	Nev.	1,500		100,000		125,000	May.	1878	0 25										30c	25c	25c		700	
New York	Nev.	1,000		100,000		700,000	Nov.	1878	0 30															
Occidental	Nev.	1,706		40,000		72,500	Feb.	1877	0 25															
Orig. Keystone	Nev.	1,500	1,000,000	100,000	10	50,000	Oct.	1878	0 50															
Overman, G. S.	Nev.	1,200	3,840,000	38,400	100	3,404,280	Sept.	1878	3 00															
Osceola, C.	Mch.		1,000,000	40,000	25	2,567,880	Nov.	1877	3 00															
Petherick, C.	Mch.		500,000	20,000	100	165,533	Mar.	1876	0 50															
Pleasant View, G.	Col.	1,200	200,000	20,000	10	*																		
Quicksilver preferred	Cal.	8,500	4,291,300	42,913	100	*					34				33¼				34½		33⅛		425	
" common	Cal.	acres.	5,708,700	57,087	100						12¼		12⅛	12	12		13		15	14	15½	15	1,985	
Rockland, C.	Mch		500,000	20,000	25	495,000	Jan..	1874	1 00															
Seg. Belcher, G. S.	Nev.	160	640,000	6,400	100	244,800	Apr.	1876	5 00															
Silver Hill, G. S.	Nev.	5,400	19,800,000	108,000	100	1,350,000	Jan..	1879	0 50															
Silver Prize	Nev.	1,500		100,000		40,000	Nov.	1878	0 15															
Star, C.	Mch.		500,000	20,000	25	265,000	Mar.	1876	0 50															
Superior, C.	Mch.		500,000	20,000	25	340,000	Mar.	1878	0 25															
Sutro Tunnel	Nev.		20,000,000	2,000,000	10				0 50															
Tiptop	Ariz			100,000		120,000	July	1878			2⅞	2¾	2¾		3		3¼	3⅛	4	3⅜	4		3,125	
Tioga	Cal.	1,500		100,000		60,000	Dec.	1878	0 20												130	120	100	
Trio																								
Trojan	Nev.	1,500		100,000		240,000	Oct.	1878	0 25		68c	60c	68c	67c	68c	66c	68c	66c	70c	68c	71c	69c	35,590	
Tuscarora	Nev.			100,000		20,000	Nov.	1878	0 05															
Union Cons. G. S.	Nev.		10,500,000	100,000	100	310,000	Apr.	1874	0 25															
Utah	Nev.	1,000		20,000		720,000	Dec.	1878	2 00															
Ward	Nev	1,200		110,000		99,000	Jan..	1879	0 30															
Wells Fargo	Nev.	1,500		108,000		216,000	Sept.	1878	0 50															

Total Assessment levied to date..... $63,512,313

Total Dividends paid to date..... $152,619,281

Total Sales for the week..... 304,449.

G. Gold. S. Silver. L. Lead. C. Copper. * Non-Assessable. + 4 15 16.

for the difference between Albany and Syracuse is given as follows:

"New York, Albany, and other large cities burn their street lamps all night and every night in the year. In Syracuse the street lamps are lighted at dark and extinguished at half-past one A.M., from nineteen to twenty nights per month."

New Haven, Conn., has 882 gas lamps, and 418 naphtha lamps. Glycerine governor burners are being tested. For gas lamps, $35 per annum is to be paid for 1879—a very low price, as 4 ft. burners are used.

Columbus, Ohio, is using coal oil to replace gas.

The Comptroller of Chicago, on December 18th, paid over to two gas companies $21,000 on account of lighting the streets for the quarter ending December 31st, 1877.

The Manhattan Gas Co. has declared a dividend of 5 per cent.

The Metropolitan Gas Co. has declared a dividend of 5 per cent, payable February 11th.

AUCTION SALES:

Metropolitan Gas-Light Co.—246 shares, at 170@170½ per cent per share.

Metropolitan Gas Co.—33 shares, at 1 7[illegible]@118 per cent.

Augusta (Me.) Gas Co.—37 shares, at 38[illegible].

Boston Gas Co.—2 shares, at $71 2½.

Charlestown Gas Co.—25 shares, at 70.

Dorchester (Mass.) Gas Co.—8 shares, at 85.

E. Boston Gas Co.—44 shares, at 29.

The following list of Companies in New York and vicinity is corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas Stocks, No. 30 Broad street, New York:

COMPANIES IN NEW YORK AND VICINITY.	Capital Stock.	Par.	DIVIDENDS. Rate per ann.	Am. of last.	Date of last.	QUOTATI'NS Bid.	As'd.
	$		P. ct.				
Mutual, N. Y.	5,000,000	$100	6	1½	Oct., '78	65	75
" Bonds	90,000	1,000	6	3½	Aug., '78	97	102
N. York "	4,000,000	.....	8	4	May, '78	87½	91
Metrop. "	2,500,000	100	10	5	Jan., '79	105	118
" Certfs.	1,000,000	.....	7	3½	" '78	95	100
Harlem "	1,850,000	50	6	3	Feb., '78	30	45
Manhat. "	4,000,000	50	....‡	5	Jan., '79	165	171
Brooklyn, Bkln.	2,000,000	50	15	5	Jan., '79	130	140
Nassau	1,000,000	25	....‡	3	July, '78	55	65
" Certfs.	700,000	1,000	7	3½	May, '78	80	90
People's	1,000,000	10	....‡	3½	Jan., '76	20	30
" Certfs.	300,000	1,000	7	3½	July, '78	70	75
" Bonds	325,000	.....	7	3½	May, '78	90	96½
Metrop. "	1,000,000	100	5	2½	May, '78	57	65
W'msb'g "	1,000,000	50	8	1½	July, '78	75	85
" Certfs.	1,000,000	.....	7	3½	July, '78	85	95
Citizens'	1,200,000	20	....‡	3	July, '78	60	70
" Certfs.	320,000	1,000	7	3½	Apr '78	90	100
J. C., N. J.	750,000	20	10	7½	Jan., '79	135	150
Municipal, N. Y.	466,000	50	.....	.....	.....	105	115
" Bonds	750,000	.....	.....	.....	.....	95	...
.....	.....	.....	.....	.....	.....	.....	...

Copper Stocks.

Reported by WILSON W. FAY & Co., Brokers in Mining and Miscellaneous Stocks, Room 7, Traveller Building, 31 State street.

BOSTON, Thursday Evening, Feb. 6, 1879.

The market has been unusually quiet the past week, though with a much firmer tone than last week.

The small stocks seem to be the principal objects of interest at present and we should not be surprised to see some unexpected developments in them before long, such stocks as Pewabic, Copper Falls, and Ridge being looked upon as selling a great deal too low, and a disposition to purchase them is manifested.

Calumet & Hecla is still firm, having advanced to 173 bid and 173½ asked, and sales at 173½.

Copper Falls is firm at 85c. to $1, and sales at $1, and is considered to be low at those figures.

Franklin is dull at about 3½@4, and no sales.

Osceola is firm at 10¼@10¾.

Pewabic sold down to 75c., there being a rumor prevalent on the street that the stock was to be assessed; but as no foundation could be found for it, it is thought to be a ruse to buy the stock. It closes at 75c.@$1.

Quincy sold up to 10½, and has been quiet since, though firm, at 10⅛@10½.

Ridge is quiet and firm, at 1@1 1-16.

Duncan has received the long-expected assessment of 50c. per share, payable February 27th, 1879, after which date no stock will be transferred on which the assessment is unpaid. The stock, when the news became known, sold down to 2½, and up again to 3, and closes firm at 2¾@2⅞, and is probably a good purchase.

International is dull, at 30@40c.

Silver Islet is firm, at 40@40¼, and sales at 40¼, some of the most sanguine holders predicting that it will go to 75.

Gold and Silver Stocks.

NEW YORK, Friday Evening, Feb. 7, 1879.

There has been a very good business done at the Mining Exchange during the past week, and also outside. A great deal of money is being invested in mines by Eastern capitalists, and before 60 days have passed they will have offered them some very attractive mining stocks.

The mining stocks listed at the New York Stock Exchange have received liberal attention. The dealings in Homestake have aggregated 1285 shares, at $24½@$25½. Ontario has shown more activity, the sales amounting to 415 shares, at $39@$39¾. Sutro Tunnel has again come into notice, the sales aggregating 3125 shares, advancing from $2¾ to $4.

The San Francisco stocks have again received very liberal attention. We note sales as follows: Belcher, 20 shares, at $6; Bodie, 70, at $8; California, 430, at $10@$7½; Consolidated Virginia, 940, at $8¼@$7½; Eureka, 60, at $28½@$31½; Grand Prize, 35, at $5@$4.65; Independence, 830, at $1.60@$1.65; Consolidated Imperial, 400, at $1.10@$1.25; Hussey, 1200, at 14@13c.; Leviathan, 1105, at 65@70c.; Navajo, 700, at 30@25c.; Tiptop, 200, at $1.30@$1.20.

In the better mines of the regular list of the Mining Exchange the dealings have been as follows; Findley, 18,900, at 50@57c.; Hukill, 200, at $3; Moose, 1700, at $4.10@$3.65; New York & Colorado, 1500, at $1.30@$1.50; Plumas, 1100, at $3.40@$3.05; King's Mountain, 100, at $1.40, and Trio, 35,500, at 60@71c.

Among the fancies, Bertha & Edith has attracted the leading attention. The sales in this stock aggregate 113,600 shares, at 10@14c. American Flag records as sold but 600 shares, at 19c. Dahlonega has been somewhat neglected, the sales only amounting to 6300 shares, at 16@15c. Gold Placer has been dealt in to the extent of 32,950 shares, declining from 25@17c. Lacrosse, with dealings amounting to 8700 shares, has ranged from 27 to 23c. Buckeye has been very active, the sales amounting to 67,600 shares, at 20@25c.

Messrs. Lounsbery & Haggin have consented to become the agents for the disposal of a portion of the stock of the Standard mine, of the Bodie District, Cal. The company will be reorganized on the basis of 100,000 shares of $100 each, or a capital of $10,000,000.

The Trio Gold and Silver Mining Co., of Clear Creek County, Colo., started a tunnel in August last, which it was expected would strike the vein at a distance of 250 feet, thereby opening up a large amount of ore, improving the ventilation, and draining the mine of the water which gave considerable trouble in the former workings. On the 30th ult. the Superintendent of the mine telegraphed: "Have cut two crevices, and it looks well." It is expected that enough water will be secured from this tunnel to supply a mill; if so, one will be erected. The company offers all information to its stockholders, and even offers to show the books. Mr. F. Hardy is the Secretary and Treasurer. His office is at No. 10 Wall street.

The Ontario Silver Mining Co. has declared its 40th dividend of 50c. per share, making a total of $2,000,000 paid in dividends. The transfer books will close on the 10th inst.

The Carbonate, Sailor Jack, Baker, Defiance, and Altorias mines on Kesler's Peak, 21 miles from Salt Lake, lately purchased by New York capitalists, have been incorporated under the laws of New York, and styled the Kesler Mining Co., with a capital of $500,000, divided into 50,000 shares of $10 each. On the 4th inst., the following trustees were elected: Robert L. Belknap, A. Wolf, Jr., Walter Edwards, Jr., Francis G. Weeks, and E. C. Atkins. R. L. Belknap was elected President and A. Wolf, Jr., Vice-President. The temporary offices of the company are at 44 Exchange Place. On Feb. 1st the subscriptions to the stock amounted to 32,166 shares. The remaining 17,834 shares are offered at $5 per share. The company reports net earnings for January of $15,000.

REVIEW OF THE SAN FRANCISCO MARKET.

The shares of the Comstock mines mark a decided improvement compared with the quotations ruling a week ago; a few exceptions to the upward tendency are noted; but the main feeling is evidently one of hopefulness and buoyancy; especially is this noticeable in mines like the Savage, Yellow Jacket, etc., where the principal check to rapid developments has been caused by the water-floods. The compromise with the Sutro Tunnel Company removes this, and paves the way for a more encouraging basis of operations, and from the present standpoint it is probable that the coming summer, when connection shall have been made between the lower levels and the tunnel, we shall witness a series of deep underground explorations.

Alpha opens at an advance of $10 per share. The flow of water in this mine has checked all operations on the 2400 level.

Alta is barely maintained. The work of stripping the ore-vein on the 1250, 1350, 1450 and 1550 levels is being pushed steadily forward at all points.

Belcher shows some improvement. The north drift from the 2560 level to connect with the south drift on the 2500 level of the Crown Point is advancing at the rate of 5 feet per day. At the annual meeting of this company, on the 28th of January, the Secretary's report showed that the receipts of the company during the year were $556,977, of which $30,225 was an over-draft at the Bank of California. The Superintendent's report showed that 2098 feet of drifts had been run, and 585 feet of winzes and upraises made, besides many other improvements.

Best & Belcher shows an advance of about $3 per share. The water at the joint new shaft is still strong, and greatly impedes the progress of the sinking. It is now down about 450 feet.

Bodie shows some advance. The new shaft of this mine has attained a depth of 365 feet, 59 feet below the second station. The main south drift is in 370 feet.

Bullion opens at $9 to-day against $8 a week ago. Sinking the main incline of this mine is being pushed ahead at the rate of three feet per day. The bottom of the shaft has passed out of the quartz, and is now almost entirely in the porphyry on the upper side of the ore vein.

Caledonia advances in sympathy with the market. Active operations are going on in this mine.

The old bonanzas, California and Consolidated Virginia, are notable exceptions to the general tendency of the list, the former opening to-day at $7⅞ against $9⅝ last week, and the latter at $7⅛ compared with $8⅜ a week ago.

The appearance of these mines is said to be very good, and their combined product amounting to 350 tons per day, of which the California contributes 280 tons. It is rumored that this latter company will pass the February dividend.

Chollar-Potosi opens at $49, against $46½ last week. The water has been drained from the bottom of the combination shaft, and the sinking is making good progress. The flow of water is quite strong, but easily handled.

Consolidated Imperial opens, at $1.30, against $1.20 a week ago. The new station at the 2600 level, in the south incline of this mine, is nearly completed, ready to start the main north and south lateral drifts on this level.

Crown Point has also advanced. We note no particular change in this mine.

A prominent feature in our report is the advance in the stock of the Eureka Consolidated Co., the closing quotation last night showing an appreciation of $8

SAN FRANCISCO MINING STOCK QUOTATIONS.
Daily Range of Prices for the Week.

NAME OF COMPANY	CLOSING QUOTATIONS Jan. 31.	Feb. 1.	Feb. 3.	Feb. 4.	Feb. 5.	Feb. 6.	Opening. Feb. 7.
Alpha	15	15	15¼	16	17½	21¾	25
Alta	8	8	7⅞	7¾	7⅞	7¾	7¾
Argenta							
Bechtel							
Belcher	5¾	5¾	5⅝	5⅞	6	6¾	6⅝
Belle Isle							
Benton							
Best & Bel.	21⅝	21½	22¾	23	23¾	23	23¾
BlackHawk							
Bodie	7⅞	7⅝	8	8	8¼	8	
Booker							
Bullion	8	7⅞	8	8⅛	8¼	9⅛	9
Bulwer							
Caledonia	2¾	2½	2½	2½	2⅞	3	3½
California	9⅝	9¾	9⅜	8⅝	7¾	7¾	7⅞
Chollar-Pot	46½	46¼	47	48½	48¾	49	49
Confidence							
Con. Imp							1.30
Con.Va	8¼	8¼	8⅛	7⅞	7¾	7¾	7⅞
Crown P'int	5½	5½	5⅝	5¾	6	6⅝	6½
Endowm'nt							
Eureka Con	27	27¾	27¼	29	29	30½	
Exchequer	5⅞	5⅞	5⅞	6¼	6¼	6⅛	6⅜
Goodshaw							
Gould &Cur	13⅛	13⅛	13⅛	14¾	14⅛	14⅛	14
Grand Prize	4⅝	4½	4½	4¼	4½	4⅝	
Hale & Nor.	16¾	16⅛	16½	18¼	18⅛	18⅛	18
Hamburg							
Homestake							
Hussey							
Indep'd'nce							
Jackson							
Julia Con	3¾	3⅝	3¾	3⅞	4	4⅛	4¼
Justice			3⅞	4	4	4	4
Kentuck							8
Kossuth							
Leopard							
Leviathan							
Manhattan							
McClinton							
MeadowVal							
Mexican	36¼	36½	36¼	37½	37	37	37½
Mono							
Navajo							
North. Belle	6	5¾	6¼	6½	8	8	
Ophir	34¼	34¼	33	33¾	34	34¾	35
Orig. K'ys'e							
Overman	10½	10¼	10¼	10⅜	10⅞	11	11
P. Sheridan							
Ray. & Ely	6½	6½		6	6	5	
Richer							
Savage	13⅝	13⅝	13⅜	15¾	15½	15½	15
Scorpion							
Seg.Belcher							22
Sierra Nev.	47¼	48	46¾	48	47½	47¼	47
Silver Hill						2⅜	2½
Silver King							
Summit							
Tioga							
Tip Top							
Union Con.	58½	58½	58	58¾	59½	60	60
Utah							
Ward							
WashoeCon							
Wells Fargo							
Yel. Jacket	20	20½	21½	24½	23½	27¼	27
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.....							
.....							

per share. A banking firm of this city has received a dispatch stating that a rich strike has been made in the Eureka. We have received no confirmatory evidence to sustain this rumor other than the advance in the price of the stock, and that may mean but little as to facts. It is given out, in explanation of the recent reduction of the dividends, that the trustees desire to accumulate sufficient funds in the treasury to sink a new shaft and erect new machinery. Official letters from the mine report that the ore-bodies are all looking about the same, and yielding their usual quota of ore, with no particular change to note in any portion of the mine.

Gould & Curry has improved. Sinking the Osbiston shaft is making slow progress on account of the strong flow of water. It is now down 428 feet.

Grand Prize is better. The stopes on the 320 level of this mine are looking as usual. The mill is supplied, and running to its full capacity.

Julia Consolidated has also advanced. The flow of water on the 2000 level of this mine continues unabated.

Mexican and Ophir are a little better. The daily yield of ore from the 1900 and 2000 levels of the Ophir mine is being gradually increased to meet the increased crushing facilities of the mills on the Carson River, which, owing to the late rain and snowstorms, have been nearly doubled.

Justice is steady. The Papoose mill is kept steadily running on the reserve ore from this mine.

Savage exhibits a notable advance. Every thing now in complete readiness to commence pumping the water from this mine to the Requa shaft. The water stands about 35 feet below the 2000 level.

Sierra Nevada is lower. Union Consolidated shows a slight advance, and Yellow Jacket an improvement of nearly $8 per share compared with the quotation of a week ago.

ASSESSMENTS with dates when delinquent: Gila, 25c., March 3d; Overman $3, March 5th; Mariposa, $1, February 12th; Red Cloud, 30c., February 28th; Watt Blue Gravel, 10c., February 27th; Northern Light, 10c., March 3d; Fairfax, 15c., February 28th; Flowery, 30c.; Belcher, $1; Lower Range, 2c.; Dudley, 25c.

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DIVIDENDS.

OFFICE OF THE ONTARIO SILVER MINING COMPANY,
No. 31 BROAD STREET, Feb. 5, 1879.

DIVIDEND NO. 40.

The Regular Monthly Dividend of Fifty Cents per share has been declared for January, payable at the office of the transfer agents, Wells, Fargo & Co., 65 Broadway, on the 15th inst.

Transfer books close on the 10th inst.

H. B. PARSONS, Assistant Secretary.

OFFICE OF THE PLUMAS NATIONAL QUARTZ MINING CO.
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